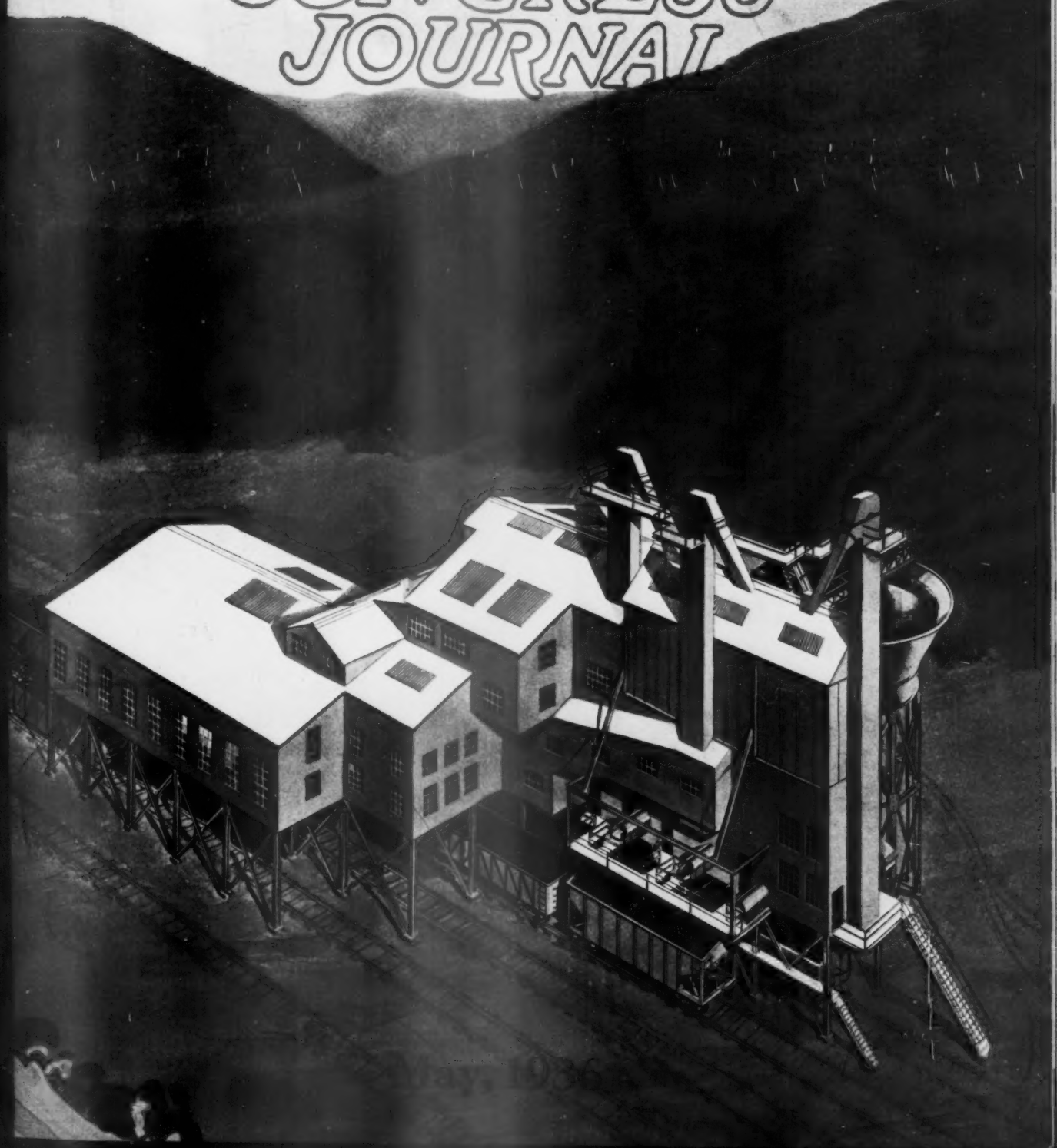
The MINING CONGRESS JOURNAL



Shoot at the sun

. . The man who places his advertising, without due consideration of the market to be reached and the medium for reaching it, might just as well be shooting at the sun.

. . In other words, be sure your gun is loaded before you pull the trigger!

. . Reach your market center, spread to every corner.

. . Let the Mining Congress Journal be your inexpensive agent.

The Mining Congress Journal

THE FOOT of GOOD SAFETY PROGRAMS

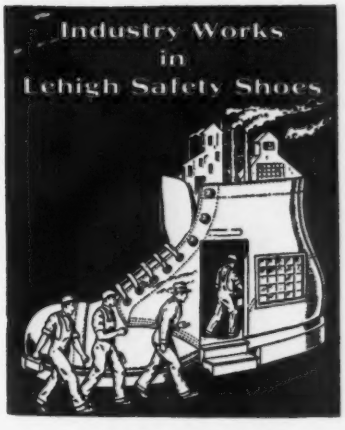
Good safety measures demand protection against foot and toe injuries by wearing of Improved Steel Box Toe Safety Shoes, and Hard Rubber Composition Box Toe Rubber Boots and Pacs.

Mining companies having their men wear Lehigh Safety Footwear have materially benefited through fewer lost time accidents, lower compensation cost and more efficient service.

Your inquiry regarding any or part of our line of safety footwear is invited. We make nothing but safety shoes, boots and pacs, using the best materials possible and the strongest construction. For sturdiness, comfort and maximum protection, try Lehigh Safety Shoes.

Call at Booth 127.

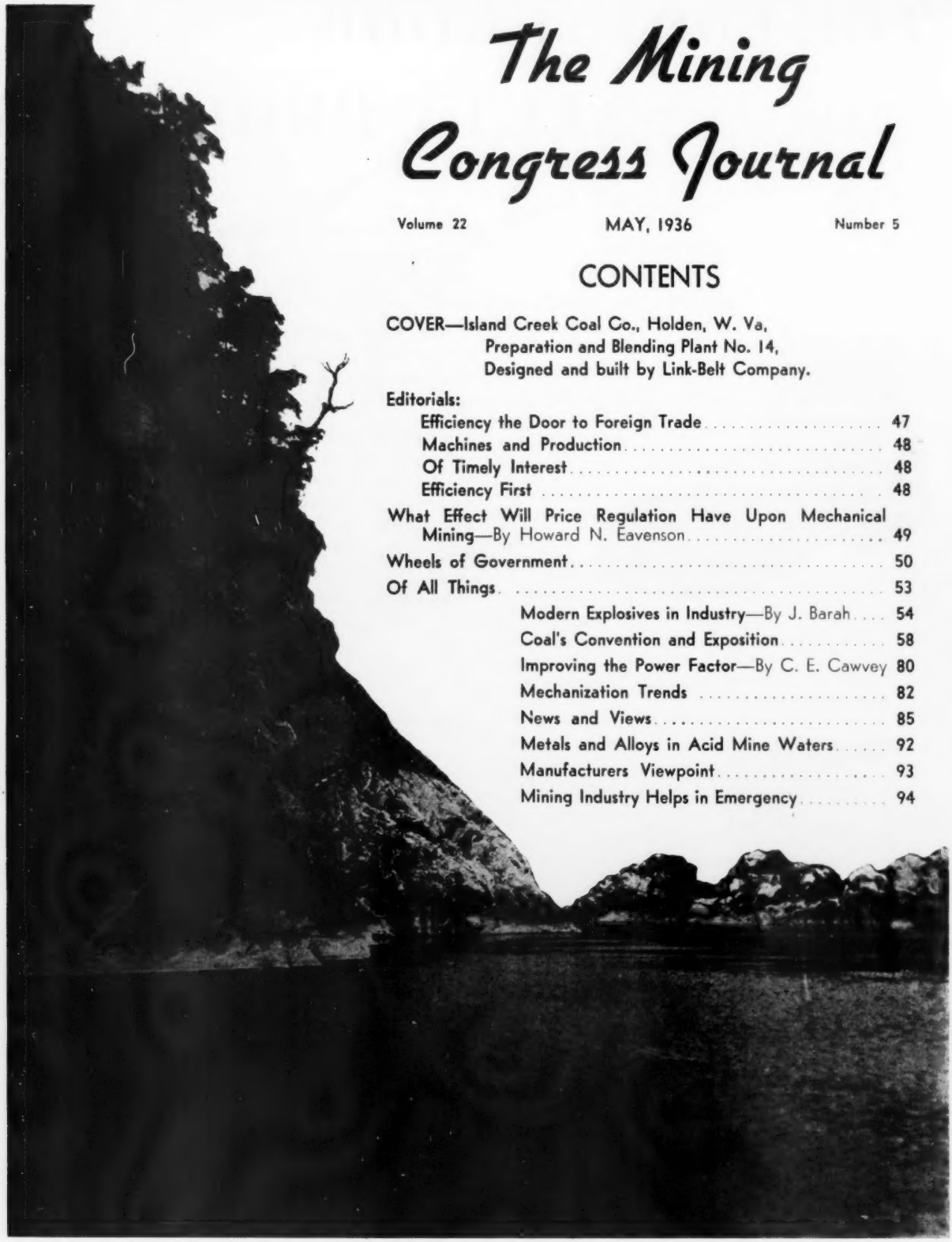
Complete line on display.



Registered U. S. Pat. Office

LEHIGH SAFETY SHOE CO., INC.

ALLENTOWN, PA.



The Mining Congress Journal

Volume 22 MAY, 1936 Number 5

CONTENTS

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Assistant Advertising Manager

W. T. HOWARD
Advertising Representative

THE ACTIVE MARKET

Uses

STUMP AIR-FLOW

Combined Coal Cleaner and Deduster

Featuring:

- **Side Windows**
- **No Reciprocating Table**
- **Low Power and Air Requirements**

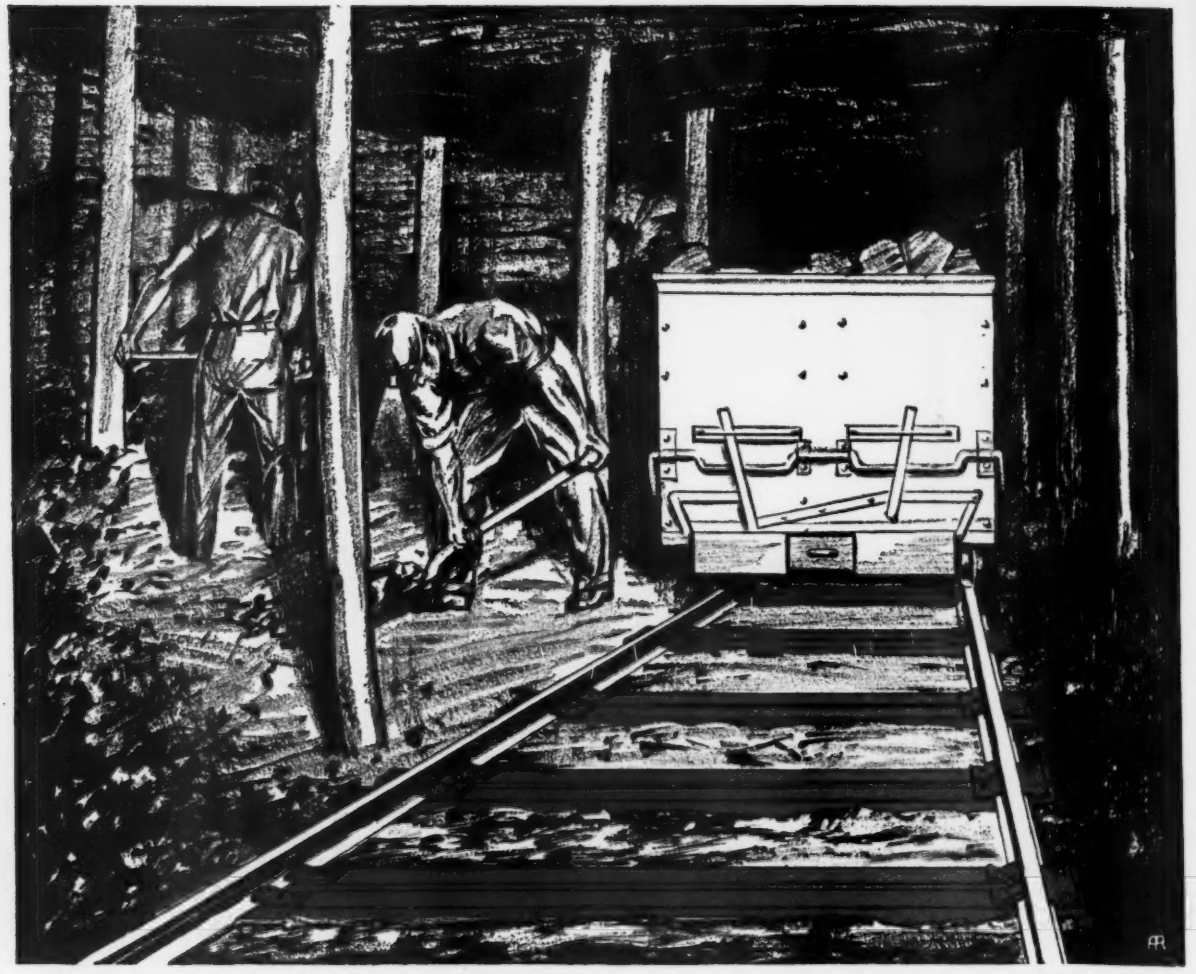
Our testing plant is equipped to handle car lot samples. Let us demonstrate on a commercial unit the cleaning possibilities of the Stump Air Flow on your coal. Write for test particulars.

If you desire to clean your coal using a wet process, or a combination of both wet and dry, our engineers are eager to help solve your problem.

Send for bulletins covering all phases of coal tipple preparation or cleaning which particularly interest you. No obligation to receive a call from our field representative. Our 34 years experience is yours for the asking. See us in Booth 438 of the Coal Exposition, at Cincinnati, May 11-15.

ROBERTS and SCHAEFER

WRIGLEY BLDG. . CHICAGO, ILL.



These BETHLEHEM STEEL TIES make completely dependable track

TRACK can be no better than the ties that are relied upon to hold it together. Most derailments can be traced to tie failure.

These Bethlehem Steel Mine Ties, painted red for identification, measure up to the demands of the most rigorous mine-railway service. Their deep, heavy sections don't bend under heavily-laden cars. The rugged rail-fastenings hold the rails in a vise-like grip, true to gage, rigidly erect, secure against spreading or rolling over even from the shocks of fast-moving traffic.

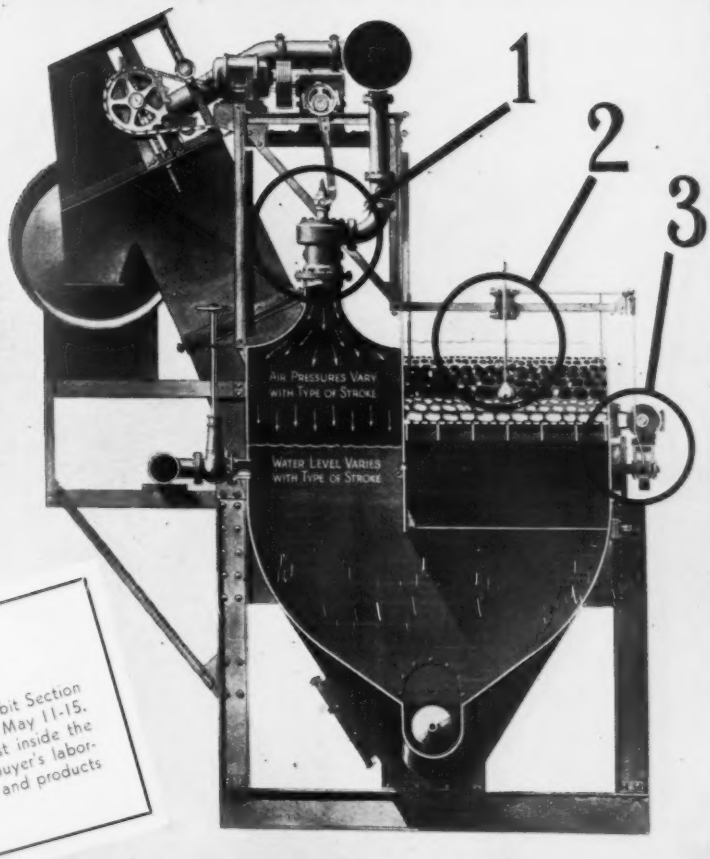
Bethlehem Steel Ties are easily installed, too. All that's necessary is to slip them in place and hit the clips a couple of blows with a hammer. Or if bolted fastenings are used, a few turns with a wrench do the job. Repeated taking up and relaying doesn't weaken the rail fastening. After having been in and out a dozen times they hold the rails as tightly as when new.

These ties bring mine railways up to high standards of safety and reliability, and at the same time sharply reduce maintenance costs. They are made in sizes to meet every mine requirement, ranging from the No. 2 Tie weighing 2½ lbs. per ft. to the Keystone No. 6 Tie weighing 6 lbs. per ft.

BETHLEHEM STEEL COMPANY

GENERAL OFFICES: BETHLEHEM, PA.

1. The types of pulsion and suction strokes are controlled completely by the adjustment of the new design of Air Valve on the Jeffrey Baum Jig.



An Invitation . . .

You are cordially invited to visit the Jeffrey Exhibit Section at the Mining Congress Exposition in Cincinnati, May 11-15. As usual, the Jeffrey Display will be found just inside the entrance to the South Wing, arranged as a buyer's laboratory . . . where new machines, standard units and products will be explained and demonstrated.

AUTOMATIC JIGS

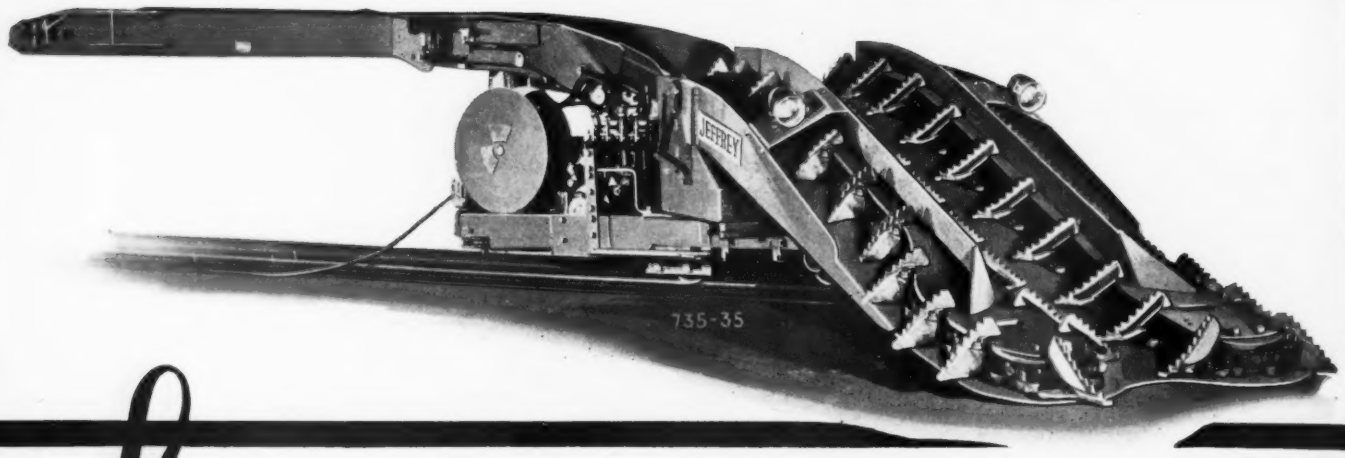
2. The streamlined "Fish Float" acting automatically to control the rate of refuse discharge.

3. The Refuse Ejector mechanism controlled automatically by the "Fish Float" to withdraw refuse at the rate of its accumulation on the screen plate.

To those interested in coal preparation we tender a special invitation to visit this particular section of our Exhibit. Let us tell you about our newly modernized line of preparation machinery . . . about recently installed Jeffrey washeries and tipples . . . about the Jeffrey automatic, adjustable Jigs that are doing a fine coal cleaning job for others . . . the high capacity Jeffrey Baum Jig . . . the moderate capacity Jeffrey Diaphragm Jig. And be sure to see the control parts of the Jeffrey Baum Jig illustrated at the left . . . they will be set up and operated at the show.

(Patent Pending)

ANNOUNCING . . A New JEFFREY Loading Machine



£400...

A High Capacity Coal Loader . . . .

The Jeffrey L-400 is the loading machine you must see at the Coal Show. Watch it demonstrated. Study the sweeping action for gathering loose coal . . . the digging action for pulling down tight coal. Notice the quick, easy maneuvering in response to finger-touch controls . . . the simple, rugged and accessible construction. In the thoroughly tried and proved L-400 you will find these operating advantages: high capacity, dependability and economy.

Its main characteristics:

Capacity . . . up to 8 tons per minute
Frontal-attack type
Finger-touch, hydraulic control
Simplicity of design; but one motor
Modified 3-point suspension, for trouble-free tramming
Automatic cable reel

(PATENTED)

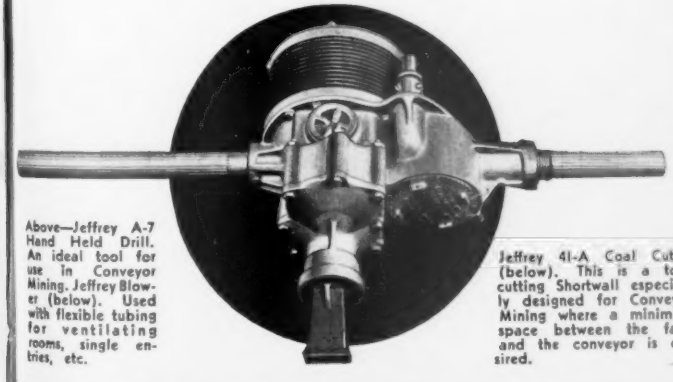
Will conveyors turn the mine-cost-reduction trick . . . and which conveyor is best? To find the answer, hundreds of mines set quietly to work, trying this conveyor and that. Very quickly they found the answer . . . in Jeffrey Underground Conveyors.

The reasons are obvious. Jeffrey knowledge of underground conditions and equipment requirements dates back nearly to Civil War days. Jeffrey had built conveyors for many years when the first call came for underground types. Jeffrey has constantly improved its designs . . . detail by detail and unit by unit. Jeffrey has a complete line of standard units for ordinary purposes . . . is prepared to tailor its designs to the exact requirements of special conditions. Jeffrey offers installation and operating aid.

Don't miss the opportunity of inspecting the Jeffrey Underground Conveyors which will be on display at the Mining Show.

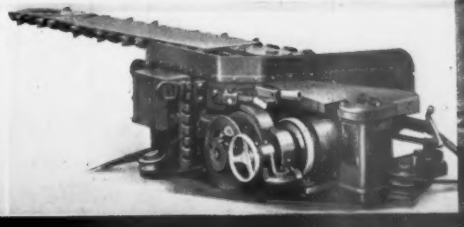
• • •

The Jeffrey line is complete . . . even to Blowers, Drills and Coal Cutters. These are illustrated below. You will find that Jeffrey has the right equipment to further mine mechanization and ventilation. The New Jeffrey 41-A Coal Cutter has been especially designed for work in connection with Underground Conveyors.



Above—Jeffrey A-7 Hand Held Drill. An ideal tool for use in Conveyor Mining. Jeffrey Blower (below). Used with flexible tubing for ventilating rooms, single entries, etc.

Jeffrey 41-A Coal Cutter (below). This is a top-cutting Shortwall especially designed for Conveyor Mining where a minimum space between the face and the conveyor is desired.



AT THE COAL SHOW

CRUSHERS . . .

No coal preparation plant can do without modern crushing equipment . . . no unit has proved itself better for preparation plant purposes than the latest Jeffrey Single Roll Crusher. It gives a uniformly sized, cubical product in one operation . . . is highly efficient for freeing laminated coals for re-treatment in the cleaning system. For reducing large coal to minus 1-inch, specify the Jeffrey Flextooth . . . and for finer reduction, the Jeffrey Swing Hammer Pulverizer.

(Patented)

Electric Vibrating SCREENS AND FEEDERS . . .

Jeffrey-Traylor electric vibrating Screens and Feeders are constantly adjustable . . . have no moving mechanical parts . . . require no lubrication . . . may be totally enclosed for handling dusty coal. The screens are peculiarly adapted to the sizing of coal. The sharp, high frequency vibrations minimize blinding and guarantee high "through-screen" capacity on fine coal. The feeders set new standards of dependence and precision in delivering coal to crushers, conveyors and cleaning systems.

(Patented and Patents Pending)

FANS . . .

Lower power bills . . . more dependable mine ventilation . . . these are the result of replacing obsolete, inefficient and unsuited fans with Modern Jeffrey Fans. Satisfaction in the purchase of a new Jeffrey Fan . . . Centrifugal, Aerovane or Aerodyne . . . is assured by expert engineering approach . . . by an analysis of your problem that goes beyond the fan itself.

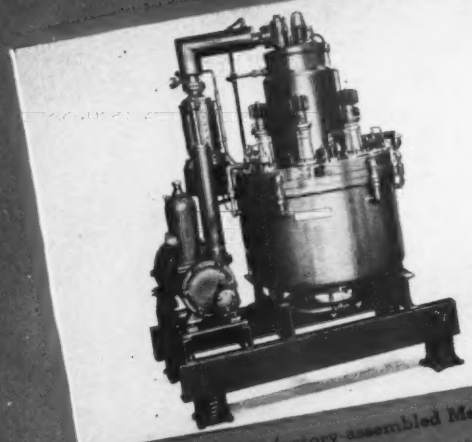
• • •

RENEWAL PARTS . . .

Nearly fifty different kinds of Genuine Jeffrey Renewal Parts . . . including Controllers, Cable Reels, Trolley Harps, Contactors, etc. . . . will be on display during the Show. You will want to see these Jeffrey highest quality Parts and learn why they are so vital to profitable operation of your equipment.

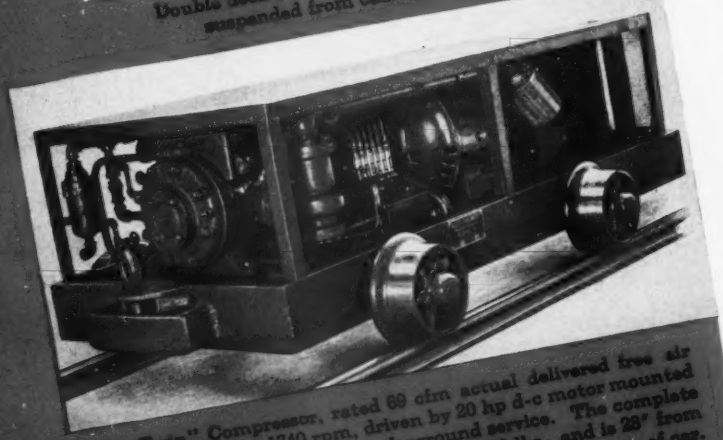

The Little
EXPOSITION

Important New Equipment at Coal Exposition



200 kw, 275 volt factory-assembled Mercury Arc Rectifier Set.

Double deck Low-Head Vibrating Coal Screen suspended from cables and springs.



"Ro-Twin" Compressor, rated 69 cfm actual delivered free air at 100 lb. G., 1740 rpm, driven by 20 hp d-c motor mounted in a mine car, for underground service. The complete unit weighs 3200 lbs., and is 28" from top of rail to top of car.

● One of the new developments to be exhibited by Allis-Chalmers in Booths 114-116 at the Coal Exposition is the Mercury Arc Rectifier, providing economical power conversion for mine haulage systems. Rectifiers have no moving parts, have high overall conversion efficiency, especially at partial loads, low maintenance cost, and are easy to operate. They will carry high overloads of short duration, operate well under the most adverse a-c line conditions. Rectifiers are immune to fumes, dust and moisture, may be operated by simple manual or automatic control and can readily be made portable.

● The new "Low-Head" Vibrating Screen will also be exhibited at the show. As its name implies it was developed particularly for installations where very little head room is available. It is suspended by means of cables and springs, horizontally, with no inclination. This makes it especially adaptable to old plants, replacing shaking screens. This new type of screen requires much less power than older types. Many have been sold for screening coal.

● The new, compact, sliding vane "Ro-Twin" two-stage Compressor will be shown. This novel compressor is an original development of Allis-Chalmers and represents a distinct innovation in rotary compressor design. In the "Ro-Twin" design the two stages and the intercooler are contained in a single casing. The small dimensions, light weight and smooth operation of the "Ro-Twin" Compressor make it especially suitable for installation in mine cars.

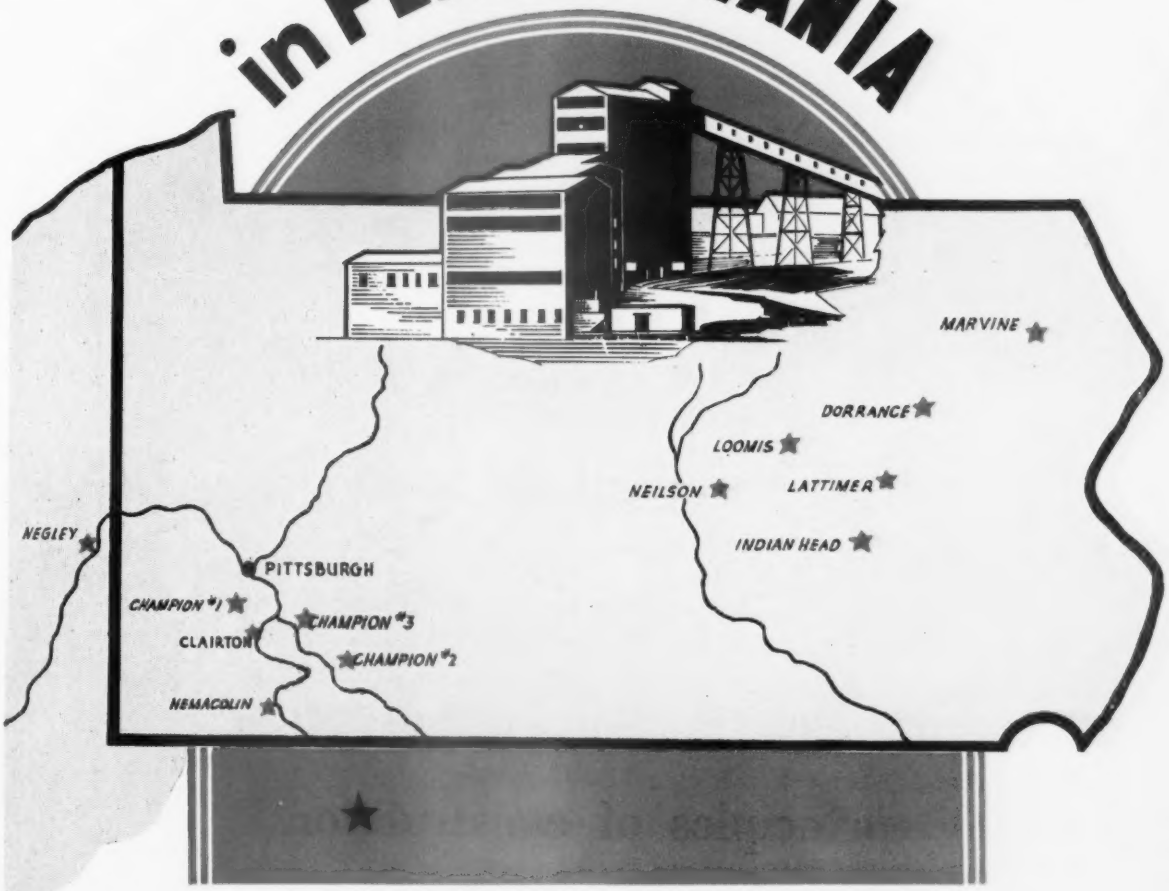
● All of the above new products of Allis-Chalmers together with motors, Texrope drives and centrifugal pumps will be exhibited at the coal show. If you are unable to see these operating exhibits write for description leaflets.

ALLIS-CHALMERS

MILWAUKEE WISCONSIN

KOPPERS-RHEO

in PENNSYLVANIA



First and foremost in the production of Rheo processed coal in the United States is Pennsylvania, with a total of 12 plants and a combined capacity of 3,165 tons of refined coal per hour. These Rheo plants are not only paying for themselves through preferred coal demand but also by making possible the maximum recovery of marketable coal from the mine output. Koppers engineers will be glad to show you in detail the PROFITABLE possibilities of Rheo in YOUR operations.

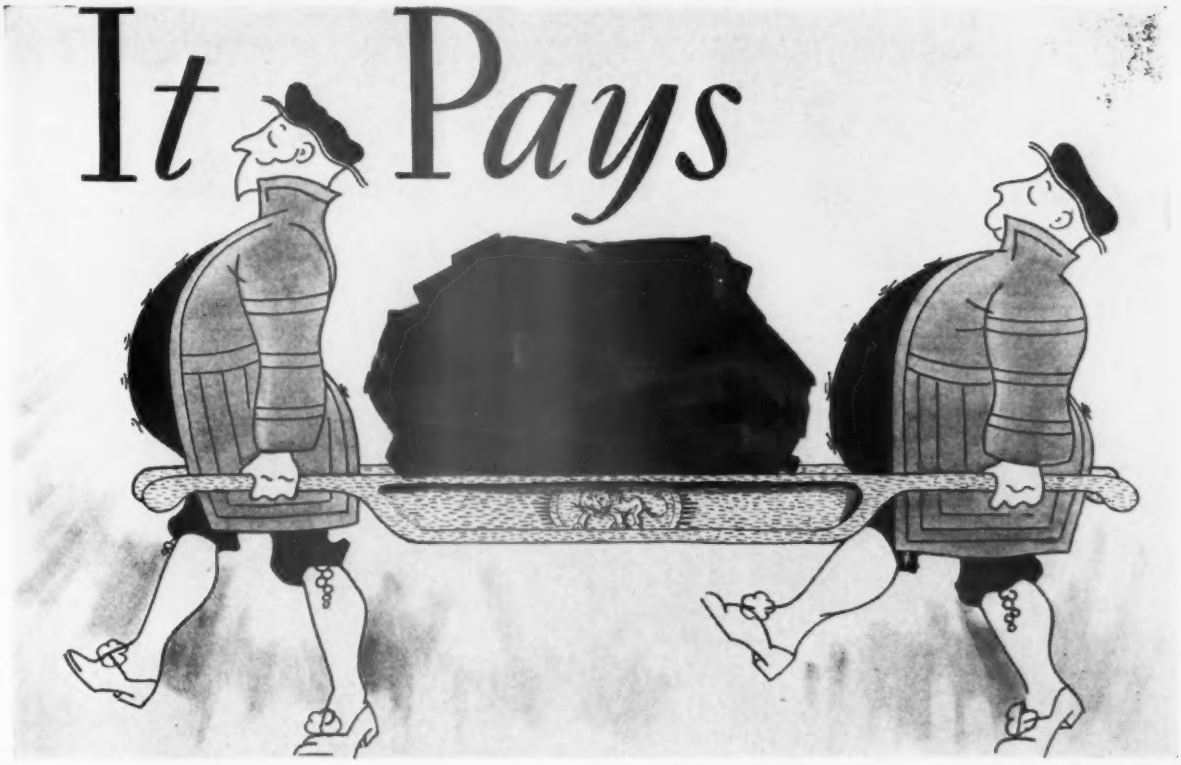
The Rhéolaveur

KOPPERS-RHEOLAVEUR COMPANY

KOPPERS BUILDING . . . . . PITTSBURGH, PA.

528 McCormick Building, Chicago, Ill. — 709 Coal Exchange Building, Wilkes-Barre, Pa.

It Pays



to handle Coal Carefully

This Robins Belt Loading Boom is a typical example of efficient coal handling with minimum power and little or no breakage.

There is no need to detail the loss to the coal man of broken product. Robins engineers appreciate his problem and therefore plan every coal handling operation so that each is not only rapid and efficient, but handles the coal gently . . . without undue breakage. Robins mine and slope conveying systems, tipples and coal handling and storage plants are making and saving money for operators in Europe, Africa, Asia, Spitzbergen, Philippines, as well as in all the coal fields of the United States. When you consider the low labor costs in foreign countries, the savings Robins equipment must make, are obvious. Visit our Booth 332, Coal Show, Cincinnati.

MATERIAL HANDLING
ROBINS
EQUIPMENT

ROBINS CONVEYING BELT CO.
15 Park Row New York, N. Y.

Send for literature relating to any Robins and Mead-Morrison products.

FOR THE COAL MINE

Robins	*Mead-Morrison*
Mine Conveyors	Car Hauls
Belt Conveyors	Car Dumpers
Chain Conveyors	Mine Hoists
Tipples Crushers	Grab Buckets
Screens Grizzlies	*Mead-Morrison products are designed, manufactured and sold by Robins.*
Loading Booms	
Car Retarders Gates	

Robins Conveying Belt Company,
15 Park Row, New York, N. Y.

Please send me bulletins about.....

.....

Name .....

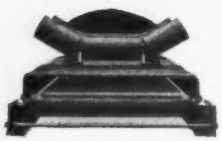
City..... State.....

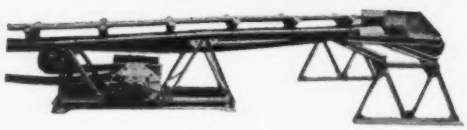
from face to tipple

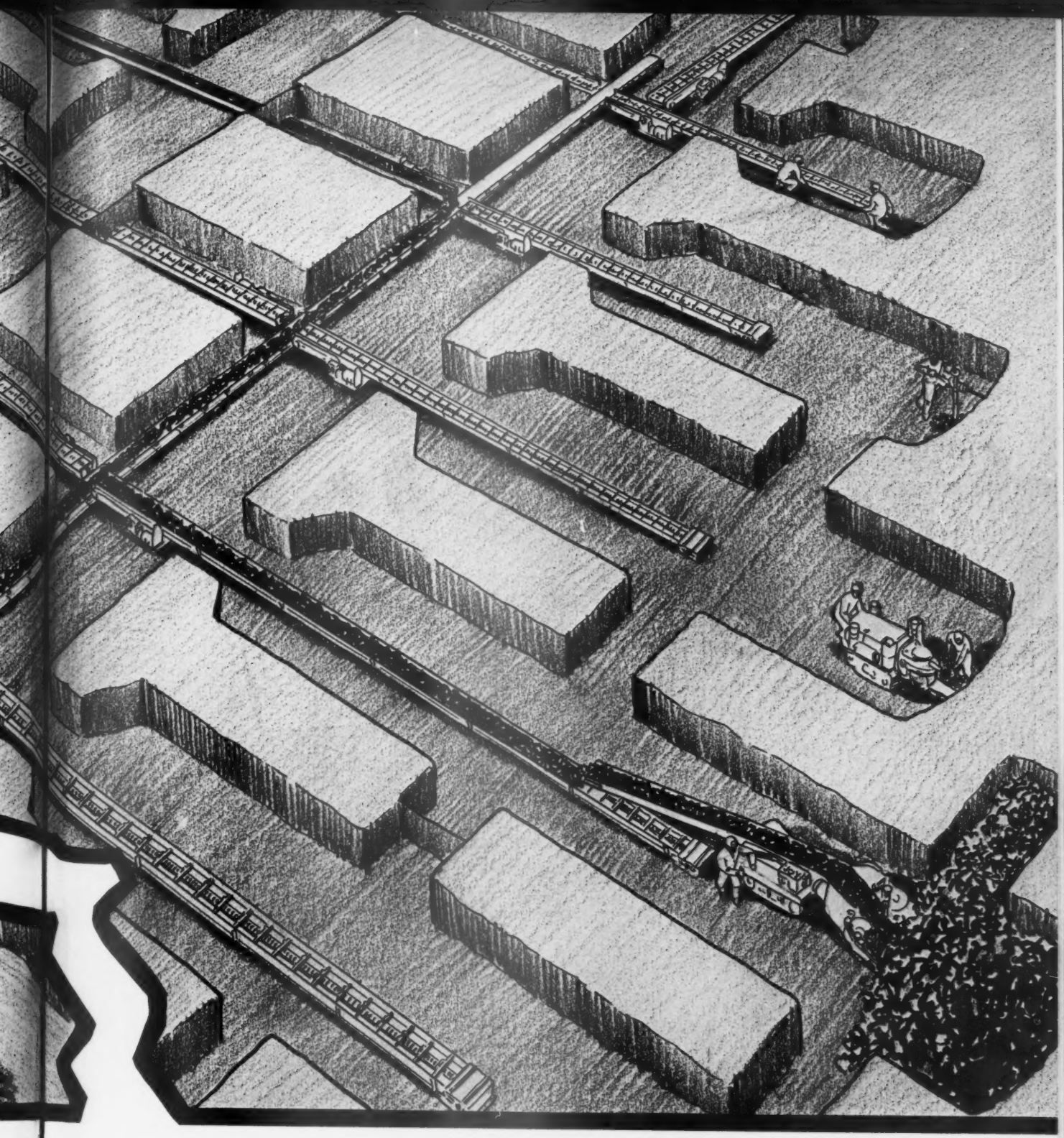
with

Joy Juniors *and*

Joy M.& C. Conveyors







The Joy Manufacturing Company

Franklin **Penna.**

See the "ELECTRIC EYE" Demonstration at Cincinnati--

● Link-Belt welcomes you to its exhibit at the American Mining Congress Exposition, Cincinnati, May 11-15 — spaces Nos. 211-217.

Make it a point to see the display of the very latest methods and equipment covering every phase of coal preparation, handling, drying and combustion, including:

● A working demonstration of the "Electric Eye" as applied to the control of the discharge of refuse from the Link-Belt Simon-Carves Washery.

● An animated motion display of new equipment for drying coal.

● The very latest in automatic heating —an actual Link-Belt underfeed type stoker will be shown.

● Other interesting exhibits of conveying, loading, blending, crushing, sizing and picking equipment as well as modern power transmission units such as speed reducers, variable speed control units and chain drives.

●

LINK-BELT COMPANY

300 W. Pershing Road, CHICAGO

Philadelphia Pittsburgh Wilkes-Barre
Huntington, W.Va. Denver Kansas City, Mo.
Cleveland Detroit St. Louis Seattle
Toronto Vancouver 5661

LINK-BELT

SIMON-CARVES COAL WASHING SYSTEM

WELCOME TO THE COAL SHOW

CINCINNATI • MAY 11 • 15 • 1936

In inviting you to our booth, we do so not only as a company, but as a group of associates who keenly appreciate the friendships of thousands of persons in the coal-mining industry.

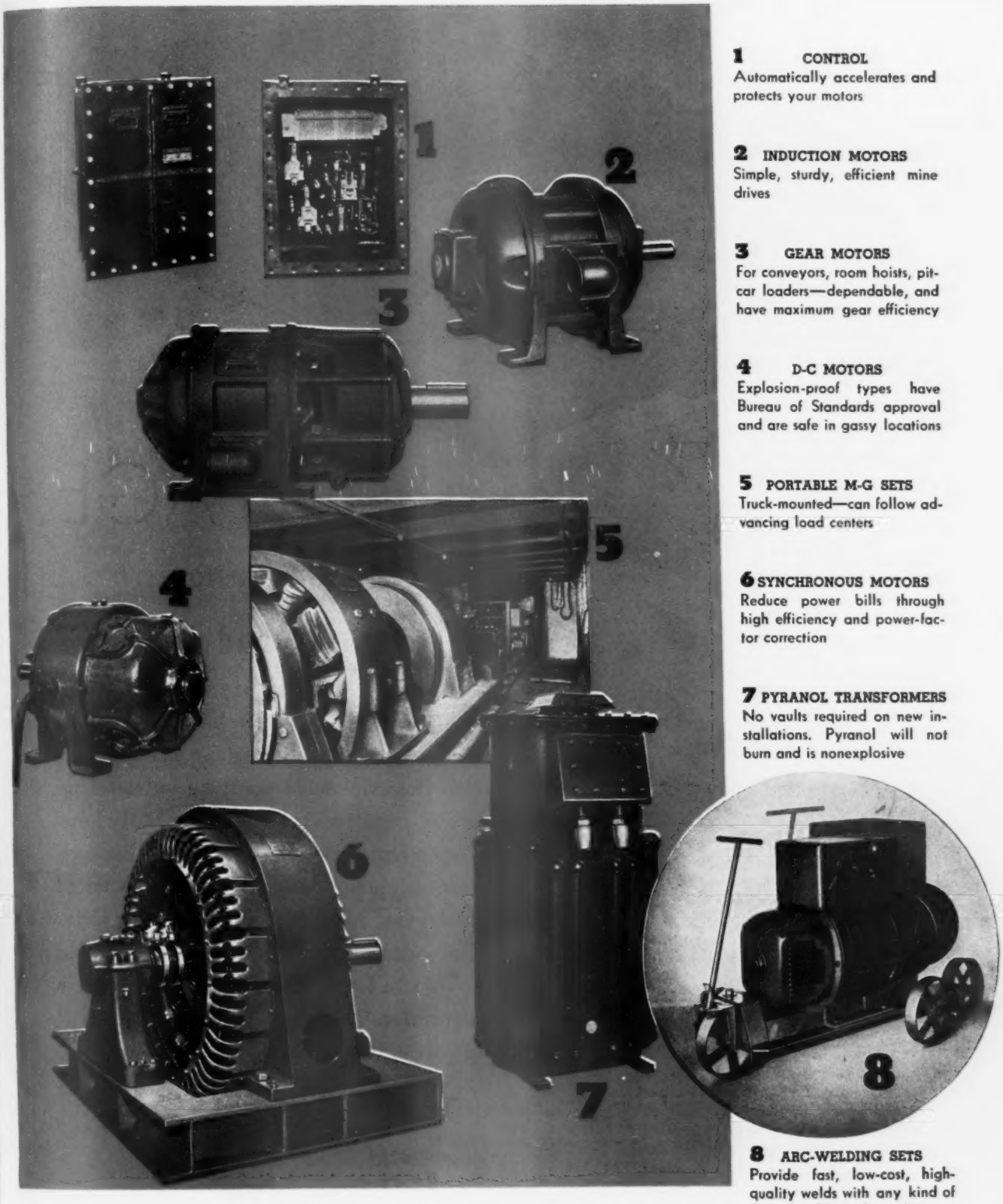
When you visit us, we shall be glad to show you our latest developments in coal-mining explosives and blasting supplies.

Booths 409-411

B-14

HERCULES POWDER COMPANY
INCORPORATED


Roebling...
The pacemaker in
wire rope development
THE most exacting basis for judging wire rope performance is AVERAGE SERVICE.
This is the basis advocated by Roebling, in which rope cost per ton of material handled, or per other unit of service measurement, is based not on the service of a single rope but on the *average* service of several ropes.
John A. Roebling's Sons Co.,
Trenton New Jersey
TRADE MARK
JAR
REG. U.S. PAT. OFF.



1 CONTROL
Automatically accelerates and protects your motors

2 INDUCTION MOTORS
Simple, sturdy, efficient mine drives

3 GEAR MOTORS
For conveyors, room hoists, pit-car loaders—dependable, and have maximum gear efficiency

4 D-C MOTORS
Explosion-proof types have Bureau of Standards approval and are safe in gassy locations

5 PORTABLE M-G SETS
Truck-mounted—can follow advancing load centers

6 SYNCHRONOUS MOTORS
Reduce power bills through high efficiency and power-factor correction

7 PYRANOL TRANSFORMERS
No vaults required on new installations. Pyranol will not burn and is nonexplosive

8 ARC-WELDING SETS
Provide fast, low-cost, high-quality welds with any kind of ferrous-welding electrodes

011-113

GENERAL ELECTRIC

Visit Exide Booth No. 537
American Mining Congress
May 11th to 15th

HAULAGE

in mechanized mines . . . . with Exide-Ironclad Batteries

In mechanized mines as well as others, for gathering and main-line haulage alike, Exide-Ironclad Batteries have made an outstanding record of performance, dependability and economy. They combine the four essential battery characteristics—high power ability, high electrical efficiency, extreme ruggedness, and long life. Exide-Ironclads can improve your haulage service and cut costs. Write for free booklet, "The Storage Battery Locomotive for Underground Haulage."

The diagram illustrates common mine practice where loading machines are used. Loaded cars are hauled out to the panel entry, only two or three at a time, and pushed into an adjacent room. Empties are picked up from another nearby room. This means frequent short, quick trips . . . rapid exchange of cars is essential in order to cut down the waiting time of the loading machine.

Equipped with Exide-Ironclad Batteries, the storage battery locomotive is ideal for this fast switching service in mechanized mines. It is a self-contained unit that assures maximum safety and responds instantly to the controls, providing swift, smooth acceleration. Its reliability cuts down delays, and a minimum of maintenance is needed.

While a loading machine puts an added burden on the generating and feeder capacity of a mine, the storage battery locomotive makes no demands on the power supply during a working shift. The battery is charged at night, thus helping to eliminate periods of peak electrical load.

Exide
IRONCLAD
BATTERIES
WITH EXIDE MIPOR SEPARATORS
"MIPOR," Reg. U. S. Pat. Off.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

A STEP AHEAD!

DU PONT'S NEW

CLASSIFICATION OF PERMISSIBLES

WE have reclassified our line of permissibles for several reasons. Not only for more convenience and simplification, but to give you every improvement made since our former line of permissibles was approved by the Bureau of Mines. In many cases—especially in the permissibles which have been registered for twenty years or so—the strength of the new permissibles has been definitely improved over the strength of the corresponding items in the old line-up. This increase in strength offers you greater savings through a higher stick count. Every du Pont permissible in the new classification represents the most modern development—and is offered to you as the utmost in efficiency and economy for the job you have at hand.

For specific information relative to grades and methods of using Du Pont Permissible Explosives, address inquiries to our nearest office.

Here are the tables showing the new classifications:

HIGH VELOCITY

	CARTRIDGES PER 50-LB. CASE
DUOBEL A	1¼" x 8"—135
" B	" —150
" C	" —165
" D	" —185
" E	" —205
" F	" —225
" G	" —250

LOW VELOCITY

	CARTRIDGES PER 50-LB. CASE
MONOBEL A	1¼" x 8"—135
" B	" —150
" C	" —165
" D	" —185
" E	" —205

PERMISSIBLE GELATINS

	CARTRIDGES PER 50-LB. CASE
GELOBEL	1¼" x 8"— 96
" 3	" — 99
" 4	" —120

E. I. DU PONT DE NEMOURS & COMPANY, INC.

EXPLOSIVES DEPARTMENT **WILMINGTON, DELAWARE**

BRANCH OFFICES: Birmingham, Ala.; Boston, Mass.; Chicago, Ill.; Denver, Colo.; Duluth, Minn.; Huntington, W. Va.; Joplin, Mo.; Juneau, Alaska; Kansas City, Mo.; New York, N. Y.; Pittsburgh, Pa.; Portland, Ore.; Pottsville, Pa.; St. Louis, Mo.; San Francisco, Calif.; Scranton, Pa.; Seattle, Wash.; Spokane, Wash.; Springfield, Ill.; Wilkes-Barre, Pa.

DU PONT REG. U.S. PAT. OFF. **PERMISSIBLES**

DU PONT ON THE AIR—*Listen to "The Cavalcade of America" every Wednesday evening, 8:00 p. m., E. D. S. T., over CBS coast-to-coast network*

And now—

—A NEW MEMBER

IMPORTANT TO OPERATORS

Advance information indicates that the American Mining Congress Convention for 1936 will be the greatest in the entire history of the mining industry. We cannot urge too strongly that you attend, and let us take this opportunity to extend you a cordial invitation to visit the Westinghouse exhibit while at the convention.

See the following Westinghouse apparatus at the convention:

- A-C. and D-C. Motors
- Gearmotor
- "De-ion" Linestarters
- Nofuze Circuit Breakers
- Mercury Arc Rectifier
- Lighting Equipment
- Line Material
- Surge-Proof Transformer
- Oil Circuit Breaker
- Watt-Hour Meters
- Industrial Analyzer
- Electrostatic Precipitator

WESTINGHOUSE 1886 W 1936 GOLDEN JUBILEE

● At the convention, you'll see displayed the new Westinghouse *Explosion-Tested SK Motor*. Inspect it closely. Notice particularly the new cover arrangement that permits quick, easy accessibility to brushes and commutator. See, too, how this new design places the ventilating fan on the front end of the motor, away from the driven machine . . . permitting closer coupling to the driven machine with no sacrifice of good ventilation.

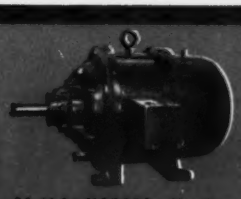
Along with these and other important new features, this new design retains all of the time-proved advantages that for years have made SK motors the mining industry's choice . . . rolled steel frame that provides a uniform magnetic circuit; commutation that stands up under peaks and overloads; long brush life; mica insulated armature coils; and vacuum-impregnated field coils.

Ask for complete information at the Westinghouse exhibit in Cincinnati, or address Westinghouse Electric, East Pittsburgh, Pa. J 20100

Westinghouse

MODERN DRIVES FOR MODERN MACHINES

CS (A-C.) MOTORS—Splash-Proof Design.



CS (A-C.) MOTORS—Totally-Enclosed Fan-Cooled Design.

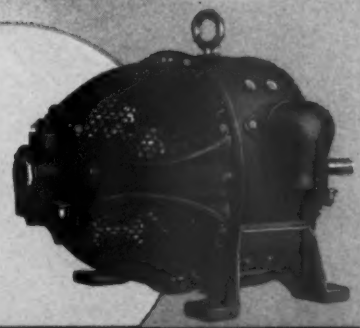
NEW "DE-ION" LINESTARTERS (FOR A-C. MOTORS)—Most important forward step in entire history of motor control equipment.

JOINS THIS FAMOUS SK FAMILY OF D-C. MOTORS

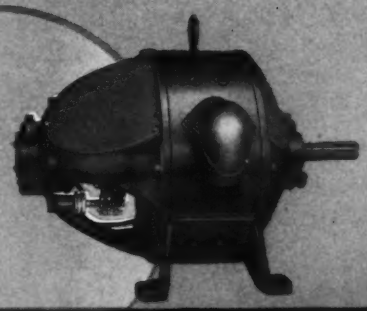
Westinghouse SK Motors have for years been the mining industry's choice for direct-current applications. They are available in various types and modifications to meet your own particular requirements. ★ ★ ★

STANDARD OPEN DESIGN

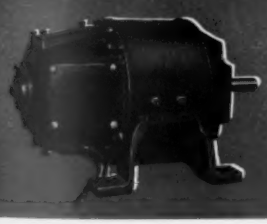
TOTALLY ENCLOSED FAN-COOLED DESIGN



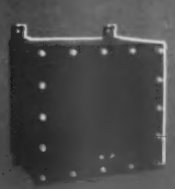
SEMI-ENCLOSED DESIGN



DRIP-PROOF DESIGN



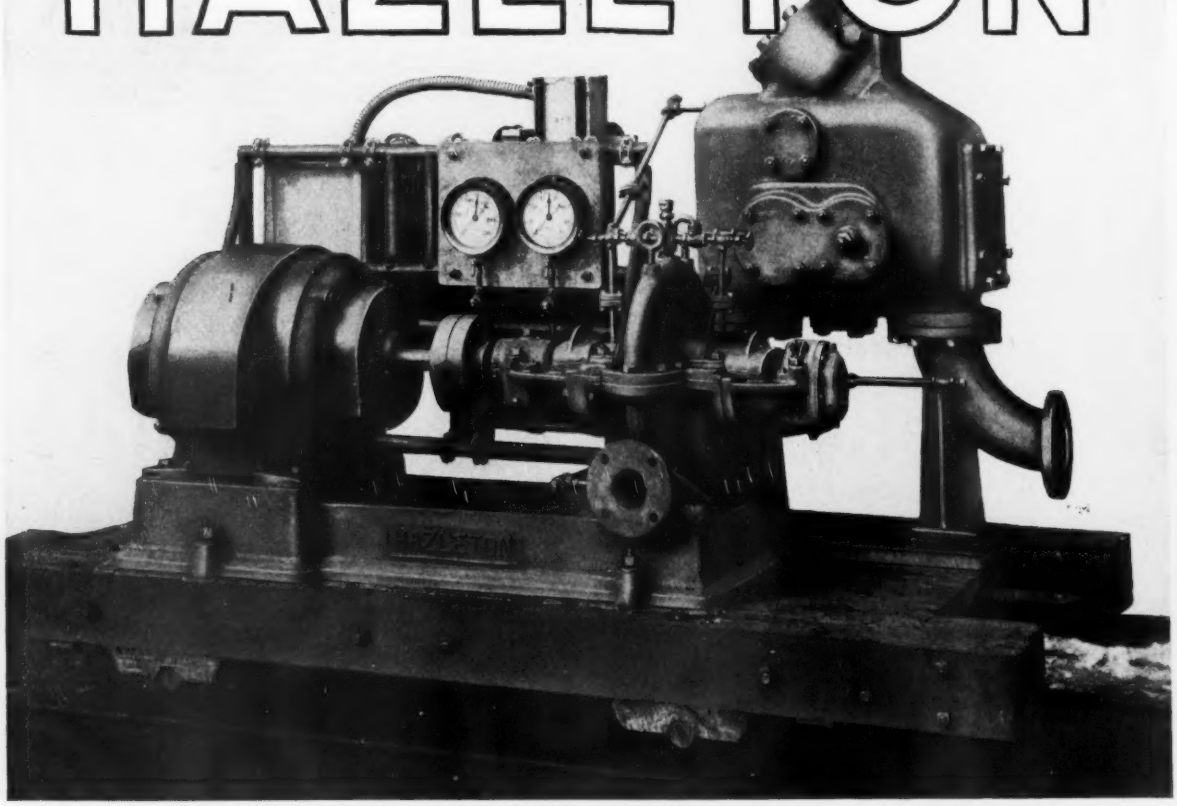
TYPE BH MOTORS—Direct-Current Room Hoist Motor.

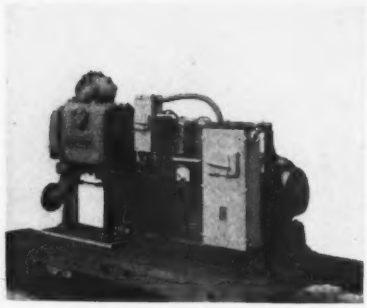


TYPE HHS STARTER (FOR D-C MOTORS)—With Explosion-Tested Enclosure.

NOFUZE CIRCUIT BREAKERS—With exclusive "De-Ion" arc quenchers, banish fuse replacements and resultant losses.

HAZLETON





Rear view showing control panel, starter, disconnect switch and signal lights.

HAZLETON Suction Line Primers are available for capacities from 50 G.P.M. to 1500 G.P.M. They can be attached to any pump, new or old, single stage or two-stage. Bulletin No. 530 fully describes the HAZLETON Suction Line Primer. Ask for a copy.

UNIQUE • PORTABLE • SELF-PRIMING AUTOMATIC PUMPING UNIT

Lehigh Valley Coal Company engineers, always alert to find more efficient and dependable equipment, were the first to purchase a HAZLETON Suction Line Primer. The performance was so satisfactory that eight of these primers are now installed on the various properties of this progressive company.

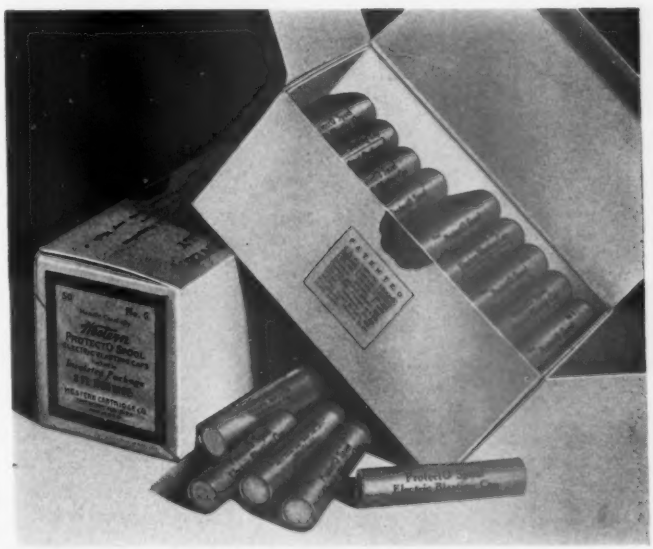
The idea of so compact a unit as that illustrated on this page was conceived by Lehigh Valley Coal Company engineers and the assembling was done in their own shops. The unit consists of a HAZLETON 500 G.P.M., 160 ft. head Double Suction Pump equipped with a HAZLETON Suction Line Primer and a HAZLETON Automatic Control Panel, mounted with a 30 HP. motor, automatic starter, disconnect switch and signal lights on a truck for portable service inside the mine. The primer is equipped with electrodes for starting and stopping.

The combination of a highly efficient Double Suction Pump with the most reliable primer makes just the right unit for mine service.

BARRETT, HAENTJENS & CO.
HAZLETON, PA.

Safer, More Convenient Electric Blasting Caps!

Western ProtectO Spool Electric Blasting Cap



Insulated Package
Provides Additional Safety

For still greater safety and convenience Western ProtectO Spool Electric Blasting Caps can be had in the Western *Insulated Package*. The complete cap assembly is enclosed in a strong, heavy paper tube, with a paper wad crimped into each end of the tube, entirely closing the package.

THE greater safety of Western ProtectO Spool Electric Blasting Caps has led to their widespread use.

Maximum safety in handling and transporting is obtained by inserting the detonator inside a heavy paper insulating spool, with the leg wires wound around the spool to prevent tangling.

When a cap is withdrawn from the carton others are not pulled out with it, to drop unnoticed and be stepped on by man or mule. The shot firer removes the exact number of caps desired—and the number used per shift is easily determined. The tinned bare ends of the leg wires are shorted by twisting them together, preventing explosions resulting from contact with charged mine rails, etc.

Extra safety and convenience in priming the shot is obtained by unspooling only enough leg wire to allow the cap to be inserted in the dynamite primer when the priming stick is being prepared. Later when the hole is being charged, the balance of the wire is allowed to run off the spool as the primer is pushed into the hole with the tamping stick.

Write us for full particulars of Western ProtectO Spool Electric Blasting Caps

WESTERN CARTRIDGE COMPANY
EAST ALTON Dept. E-51 ILLINOIS

Western

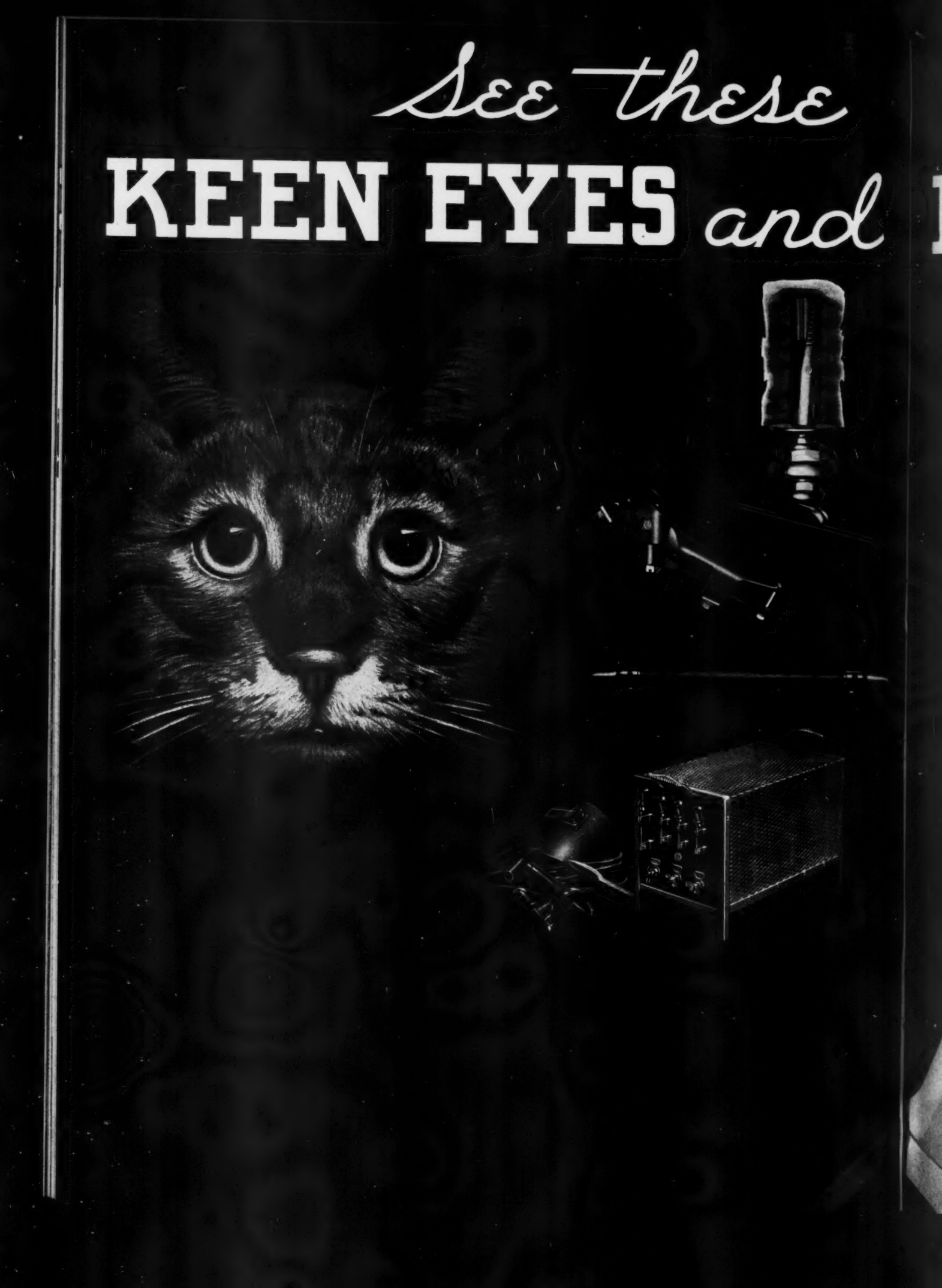
ProtectO Spool

ELECTRIC BLASTING CAPS

BLASTING CAPS . . . ELECTRIC BLASTING CAPS . . . PROTECTO SPOOL ELECTRIC BLASTING CAPS . . . PROTECTO LOOP ELECTRIC BLASTING CAPS . . . SEISMOGRAPH ELECTRIC BLASTING CAPS . . . DELAY ELECTRIC BLASTING CAPS . . . DELAY ELECTRIC IGNITERS

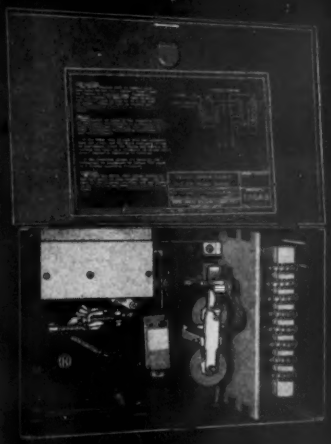
See these

KEEN EYES *and*



results of

PRACTICED HANDS



Keen eyes! Practiced hands! An unbeatable combination for developing sturdy, dependable, cost-reducing equipment. And this powerful combination, used by O-B engineers, is one of the most important reasons for the fame of O-B mining materials. Keen eyes see the need for quality, proper operating characteristics, ruggedness and simplicity, and practiced hands transfer designs into finished products.

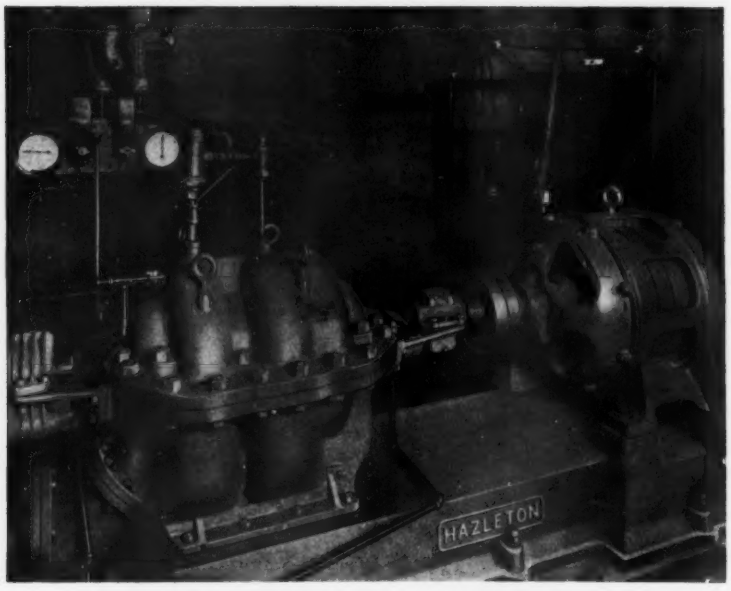
Attend the convention sessions and hear the discussions on the latest and most modern mining methods. Then visit the O-B exhibit and see many of the overhead, track, locomotive and safety devices which are making modernization programs simple, inexpensive and profitable.

1851-M

OHIO BRASS COMPANY
MANSFIELD, OHIO

CANADIAN OHIO BRASS COMPANY, LIMITED
NIAGARA FALLS, ONT., CANADA

SKF-EQUIPPED
BUILT BY
BARRETT,
HAENTJENS & CO.



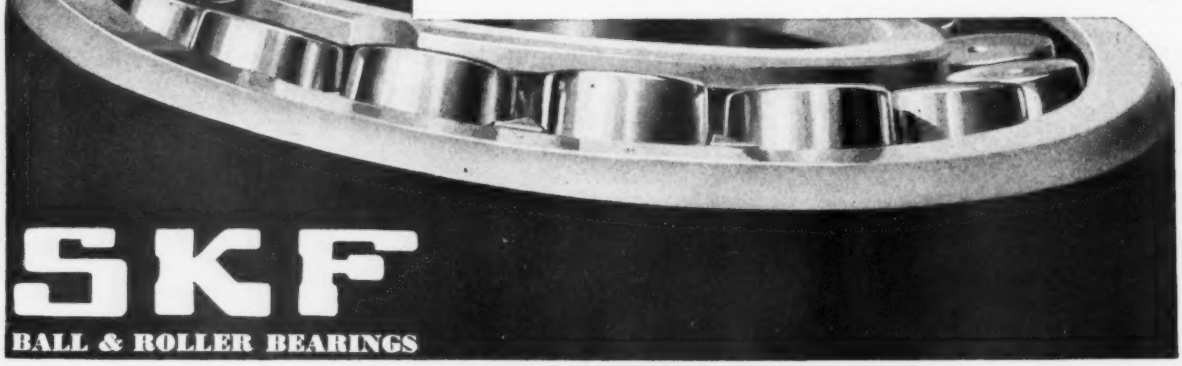
PUMPS 2,000 G. P. M.
with SKF *Bearings taking the loads*

Cleaning out water from the floor of a coal mine isn't any soft snap. It calls for pumps that can stand the gaff . . . for long life bearings that can take varying radial and thrust loads without falling down.

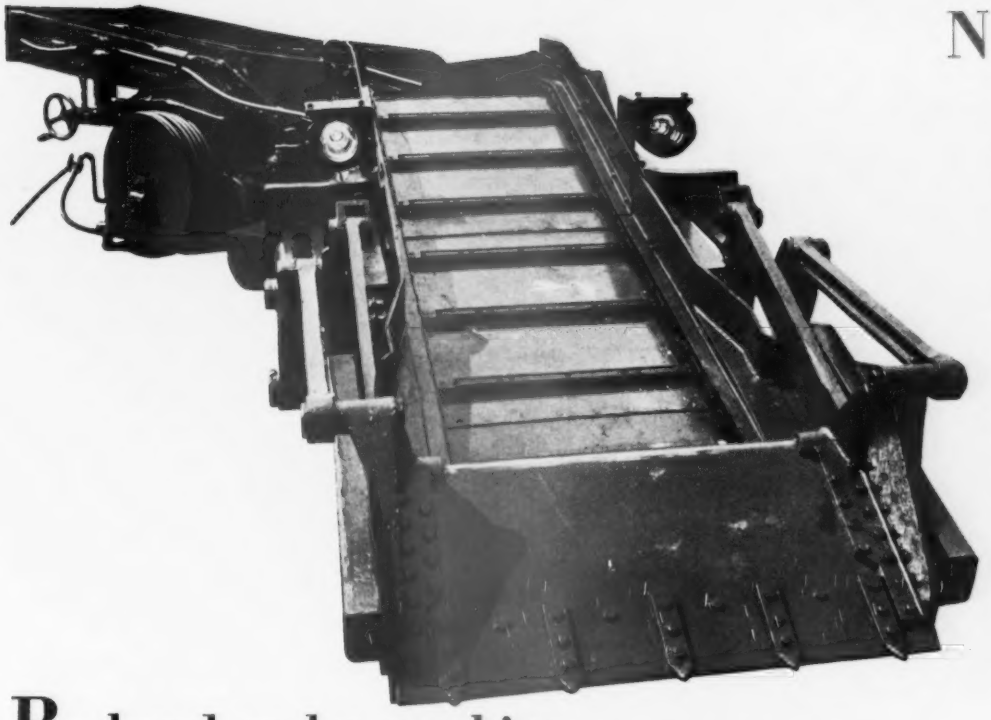
This Hazleton Type D-S Double Suction Single Stage Pump, driven by a 200 H. P. motor at 1170 R. P. M. against a total head of 300 feet, pumps 2,000 G. P. M. Its bearings, of course, are SKF. That's why it can keep going from dawn to dark every day without the slightest bearing trouble. SKF are built UP to the job . . . *always.*

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

3589



SKF
BALL & ROLLER BEARINGS



NOTE the Smooth, Easy Motion of the Automatic Shovel—

See it in operation at the Exposition, South Hall, Booths 320, 322, 324, 326. You will then understand why this machine loads coal, with little or no degradation, at a maximum of 7 tons per minute, and an average rate of 3 tons per minute, and a power consumption of

One-fifth of a kilowatt hour per ton loaded.

By hand or by machine

The fastest and cheapest way to load coal is to

Shovel it

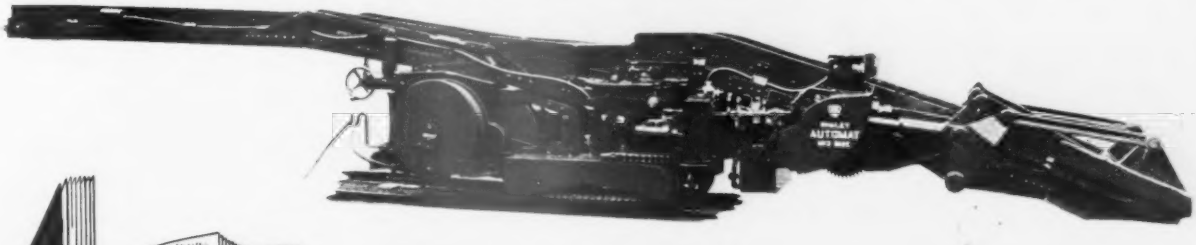
And the fastest and cheapest way to

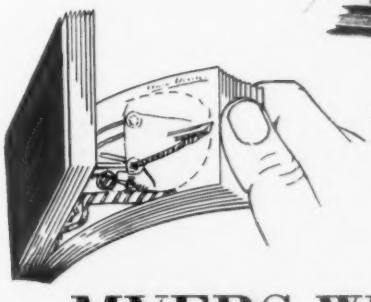
Shovel it

is with

The "Whaley Automat" Coal Loading Machine

A real Shoveling Machine





THIS booklet will enable you to obtain a clear and accurate picture of the unique Shoveling Motion of the "Whaley Automat," original, new and patented. Ask for your copy at Cincinnati, or write to the

MYERS-WHALEY COMPANY, INC.

KNOXVILLE, TENN.

Erskine Hazard

FIRST SUCCESSFUL USER OF ANTHRACITE

It was in the wire mill of Hazard and White, (Schuylkill, Pa.) that anthracite coal was first successfully used as a "heater." In 1814, two arks of coal were brought from the Lehigh region by Cist, Miner and Robinson, and sold at $1.00 per bushel. Hazard and White bought a cartload of it but this was wasted due to their lack of experience in burning hard coal. Another cartload was purchased and the whole night spent in a futile attempt to get it to burn. Finally all hands shut the furnace door and quit the mill in despair. Fortunately one of the men left his jacket in the mill, and upon returning for it a half-hour later found the furnace door red hot — the interior of the furnace a glowing white heat. This important discovery (how to burn anthracite) not only helped develop the coal industry but led to the development of Hazard wire rope. And Hazard rope has been so consistently uniform in high quality that we have a number of customers who have bought Hazard rope continuously for 30, 40, and 50 years. . . The best possible testimonial to both quality and service.

Visit the Hazard Exhibit at the Mining Congress Exposition — Booth No. 638

ALL HAZARD WIRE ROPES MADE OF IMPROVED PLOW STEEL ARE IDENTIFIED BY THE GREEN STRAND

HAZARD WIRE ROPE COMPANY, Inc.

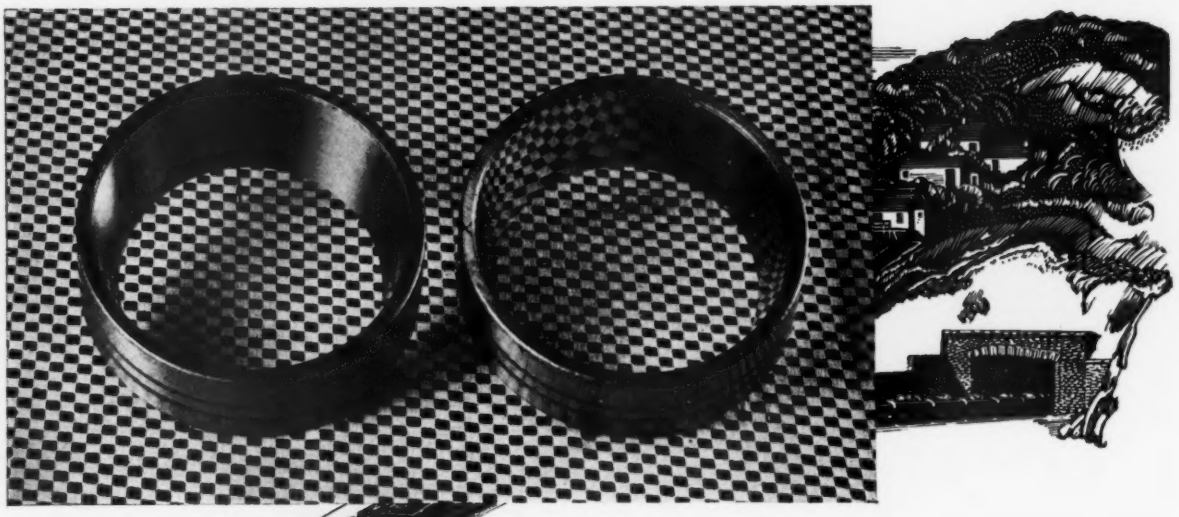
WILKES-BARRE, PENNSYLVANIA

An Associate Company of the American Chain Company, Inc.

IN BUSINESS FOR YOUR SAFETY

District Offices: New York, Chicago, Philadelphia, Pittsburgh, Ft. Worth, San Francisco, Denver, Los Angeles, Birmingham, Tacoma

TIMKEN Steps Ahead AGAIN



Timken Mirror Finish Cup (right) compared with a standard ground cup.

with MIRROR FINISH BEARINGS

Now — longer bearing life and easier rolling mine cars — through the latest Timken development — Timken MIRROR FINISH Bearings.

The Timken Bearing is the standby of the mining industry —with an unapproached record behind it of less than one-fourth of one per cent replacements in more than 250,000 mine cars over a period of 16 years.

Timken now crowns this remarkable achievement with a development that places Timken-equipped mine cars as far ahead in life expectancy and ease of rolling as they are in radial-thrust load carrying capacity; dependability; endurance; lubrication savings; and maintenance economy.

What mine operator can afford to take a chance on unproved claims when Timken offers a performance record that approaches perfection — in every bearing quality required in mine cars?

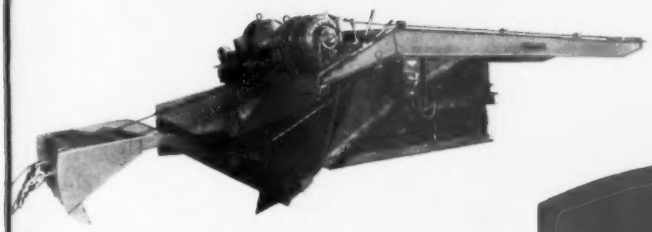
It will pay you to specify—and insist on—Timken Bearings when buying new mine cars.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

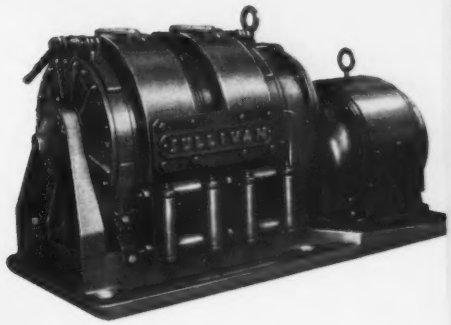
TIMKEN *TAPERED ROLLER* BEARINGS

SULLIVAN

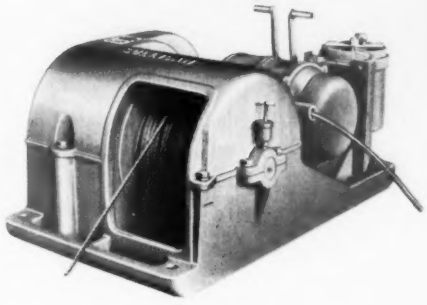
LEADERSHIP SETS THE PACE



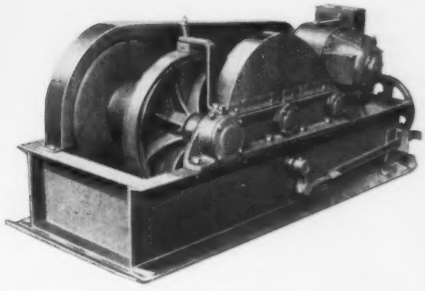
Sullivan "LOHITE" Rock Loaders—have broken many low cost records—for loading rock when brushing entry, pulling top, lifting bottom or loading rock in headings or air courses. Has outstanding advantages of low initial cost, low upkeep costs, fast loading speed, maximum mobility and simple operation.



Sullivan two and three drum scraper hoists are known throughout the coal fields for performance and economy. They can be quickly moved from place to place, can be set up in low cramped areas and are easily adaptable to various systems of coal mining. Made in sizes from 7½ to 150 H.P.



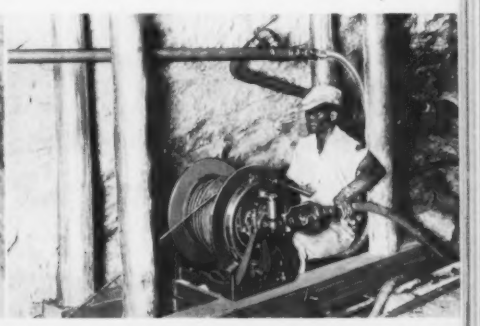
Sullivan Room Hoists—for car spotting and car pulling on pitching seams are particularly adapted to room systems of mining. They relieve the loaders of man-killing labor and replace gathering locomotives at lower initial and lower operating costs. Rope speeds are from 75 to 175 feet per minute with rope pulls up to 2100 lbs.



Sullivan Car-puller Hoists are heavy duty, slow speed single drum hoists. They provide the most economical methods of moving trips of mine cars slowly past a loading point. They replace locomotives and are a necessary part of the equipment where conveyor or scraper loading is employed. Very slow speeds with rope pulls up to 6000 lbs. are available.

Sullivan double drum hoist, operating in Lehigh Coal Company mine. Many similar units are at work in the coal mines of England & Africa.

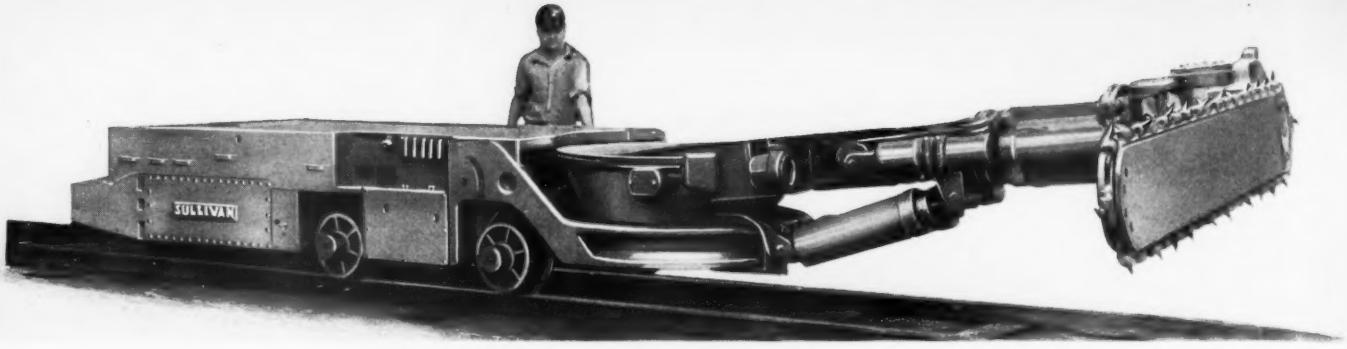
Sullivan "LOHITE"—loading rock in a large bituminous coal mine. Note scraper about to drop its load into car below after loading from entry where bottom has been taken up.



Sullivan F-112 Portable Single Drum Air Hoist pulling cars in a South African Coal Mine.

SULLIVAN

SETS NEW STANDARDS IN



Until Sullivan introduced the 7 AU Track Cutter the term "Universal" as commonly used in connection with coal cutters had no real meaning. The word "Universal" should have always been descriptive of a machine that would Overcut, Centercut, Bottomcut, Centershear, Ribshear, Angleshear, Slabcut and Slabshear at any point between the roof and floor of the coal seam. The Sullivan 7 AU Track Cutter most efficiently performs any or all of these operations. In addition to these it has Bar Tilt and Roll and No Dead Spots. It is a Genuinely "Universal" Track Cutter and Genuine Proof of Sullivan Leadership.

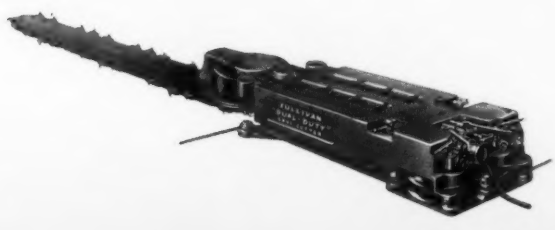
The Sullivan 7-AU is licensed under patents to E. C. Morgan. Patents No. 1,706,961—1,706,962—1,707,132—1,953,325—1,953,326.

A NEW SHORTWALL—LONGWALL

SULLIVAN "DUAL-DUTY"

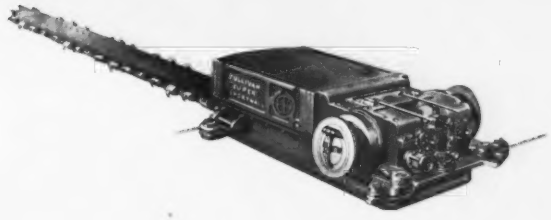
Something entirely new in Coal Cutters

Recognizing the modern trend toward longface mining, Sullivan offers a New Combination Shortwall-Longwall Coal Cutter. The Sullivan Type 8-B "Dual-Duty" was created to meet the new demand for a machine for use either as a shortwall machine in driving narrow development work or as a longwall machine on longface work. Longface work introduces more nearly continuous cutting. Besides the many other new features, the Sullivan "Dual-Duty" Coal Cutter is super-powered for faster cutting and long continuous runs—More Proof of Sullivan Leadership.



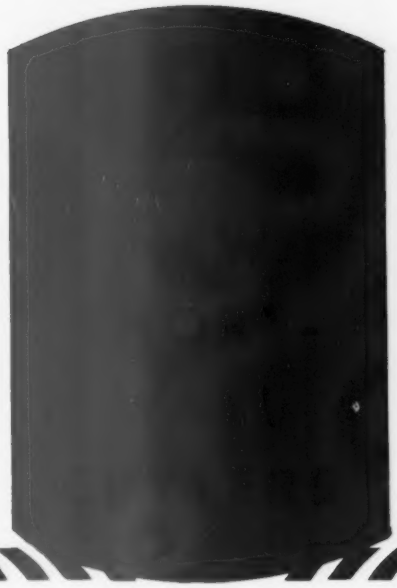
LEADERSHIP

COAL CUTTER DESIGN



SULLIVAN
"MASTER"
for Thin Seams

The Sullivan "Master" Shortwall was designed to meet the demand of thin seam operators for a machine of increased capacity and capable of more continuous operation. It possesses many outstanding features not to be found in other low vein shortwall machines.



SULLIVAN
"SUPER"
for Thick Seams

Modern coal loading machines have established records beyond the capacity of prevailing types of shortwall machines. The Sullivan "Super" Shortwall was created to meet the demand from mechanized mines for a shortwall coal cutter with a capacity equal to that of modern loading machines.

OUTSTANDING FEATURES Common to all types

The New Sullivan Type 6-B "Master" Shortwall, Type 7-B "Super" Shortwall and Type 8-B "Dual-Duty" Combination Shortwall-Longwall Coal Cutters all possess the same ruggedness of design and features of operation. The electrical equipments are identical and most of the mechanical parts are interchangeable. This duplication of parts makes possible an increased volume resulting in a lower manufacturing cost. Therefore, each of these products represents a new value in coal cutters to the ultimate user at no increase in price.

1. More Powerful Motor
2. Higher Cutting Speed
3. More Power in the Cutter Chain
4. Duplicate Drum Drives
5. High—Low Speed, Both Drums
6. Separate Drum Retarding Frictions
7. Lever Controlled Drum Clutches
8. "Free-Wheeling" Provided in Drums
9. More Direct Lead of Feed Ropes
10. "Drop-Out" Chain Clutch
11. Complete Rear-End Control
12. Rear-End Cable Entrance
13. Simplified, Dependable Electric Control
14. Ball Bearings Throughout
15. Splash Lubrication
16. Unusual Accessibility
17. "A Real Two-Direction Cutter"
18. A New Type, Ball Bearing, Reversible, Tramming Truck

SULLIVAN

LEADERSHIP SETS THE PACE

It's Here!

The SULLIVAN MINE-AIR

A NEW LOW HEIGHT MINE CAR COMPRESSOR

- Proven "V" Type Air Cooled Design
- Direct Drive—Unit Construction
- Completely Enclosed and Protected
- Fully Accessible
- Force Feed Lubrication
- Anti-friction Bearings
- "Long" Floating Axles
- Roller Bearing Wheels
- Push Button Control
- Miller Connectors

Built by the leading manufacturer of Mine Car Compressors

The Superior

The H-2 has been designed for the coal fields, to drill coal, sandstone and soft shale, and yet it has enough drilling power to give excellent performances in hard rock. An ideal drill for the coal miner is the new H-2 by reason of the following features:

Auger Drill

1. Will increase your daily footage —a balanced force of blow prevents the steel from being buried in soft drilling conditions.
2. A strong powerful rotation—coal, sandstone and soft shale conditions find it hard to stop this rotation.
3. Designed for convenience—even the grips are designed to make it easier for the operator to handle.
4. Low upkeep costs—results of rigorous trials in shop and field are definite proof. Try one yourself.

Efficiency the Door to Foreign Trade

WE trust our readers will not become too weary because of the many reiterations of the fundamental principle of all trade relations, foreign and domestic, that merchandise cannot be sold in any market except upon a competitive basis and that high-cost goods cannot be sold in a low-cost market except at financial loss.

Bills were recently introduced in Senate and House known as the Lewis-Mitchell bill to create a Federal foreign trade board.

These bills were inspired by the report that our imports during February, 1936, were $10,191,000 more than our exports, which means that foreign labor displaced 60,000 American workmen at $5.00 per day.

As compared with the 10,000,000 unemployed, this does not seem to be startling except as you are convinced that 60,000 men employed in productive enterprises accomplish more toward a return to prosperity than many times that number upon foolish unproductive and frequently harmful undertakings.

The authors of the Lewis-Mitchell bill base their approval upon the success of the British East India Company and other European trading companies and assume that a government controlled agency similar to those in foreign countries could accomplish similar results for the United States export trade.

The sponsors of this bill evidently have overlooked the fact that the principal foreign trade company cited was privately owned and managed and that it was not until it assumed the functions of government that any effort at control was made by the British Government.

The British East India Company was chartered in the year 1600. About 75 years later under Charles II the company was given the right "to acquire territory, coin money, command fortresses and troops, form alliances, make war and peace and exercise both civil and criminal jurisdiction."

It was not until 1858 that these powers were surrendered to the crown.

No one will question the great influence on foreign trade exercised by these companies, but it must not be overlooked that these were privately owned and managed and that they were assisted by the governments whose commercial interests were served by their exploitations.

Furthermore, they were monopolies of far-reaching control and their success was based upon executive business direction and management enforced by the authority of self-constituted governments.

The use of any such machinery to market our surplus production in foreign countries would be contrary to all present-day business policies.

New and costly governmental agencies will only confuse the situation.

Only by putting ourselves on a competitive basis can we hope to expand our exports.

If we could offer steel f.o.b. our ports at half the current price, does anyone doubt that world builders, in all countries, would be at our ports to fill their steel requirements. "He who builds the best mouse trap will have a trail built to his door in a wilderness"——

Efficiency, then, is the key to foreign trade. Higher production costs, higher price levels can only be maintained in a strictly self-contained country.

We must choose between high production cost and price levels under strict Nationalism and low production cost levels and a door to foreign markets.

J. F. Ellis

The Mining Congress Journal

Volume 22 MAY, 1936 Number 5

E. R. COOMBES, Editor

A Journal for the entire mining industry published by The American Mining Congress

Efficiency First

IT IS a welcome relief to find a major industry proceeding under its own steam toward efficiency and increased profits, not depending upon any political factor for aid and, in fact, proceeding in spite of the political factors. We refer to the coal industry—an industry that has been beset with political difficulties; that has been and is a political football, from its labor relations to its sales to customers.

As evidence of coal's disregard for things political, we call attention to the efficiency of its methods of production and its concentration upon Safety, Economy, and Conservation. Since the first of January, for the thirteenth consecutive year, this industry has devoted weeks to the cooperative preparation of a program for its annual convention and exposition. A program that discusses only practical operating problems; a convention and exposition that has but one thought in mind—mining the Nation's coal supply with the greatest efficiency, and furnishing to its market a product of superior quality.

"The keen competition of substitute fuels is challenging the resourcefulness of those in charge of production. Coal must be produced at a price to meet the competition, and at the same time return a reasonable profit to investors, pay the increasing tax bill, and pay a reasonable wage to its employes.

Let politics roar. The industry will continue to work out its production problems and to furnish the cheapest power-fuel the world has ever known. It will continue to furnish employment to thousands of workers and remain the backbone of our industrial advancement.

Machines and Production

IN 1935 WE produced 365,000,000 tons of coal, which is about 70 percent of our developed capacity. A considerable proportion of that tonnage was produced by mechanized mines. The rapidity with which the coal mines are turning from hand to machine methods is startling. Hundreds of companies are installing modern mining equipment, building cleaning plants and generally raising production efficiency.

Machinery and Allied Products Institute recently issued some interesting statistics concerning the use of machines in industry that go far in refuting an argument advanced with increasing frequency by labor unions. They point out that this country's most intensive development occurred between 1900 and 1930, when, according to their estimates, 422 new jobs were created for each 1,000 of population, which increased in that period by 47,000,000 people. They state that 18 major industries have been wholly developed since 1880, and that one in each seven factory workers today has a job making some product that was unknown 50 years ago.

It is easy to accept their estimate when we think of the number of things in common use today—automobiles, radios, moving pictures, refrigeration—which were totally unknown 50 years ago, and which have built up large industries employing millions of people.

There is abundant proof that the machine age has brought its advantages, not the least of which is the increased wage. The coal industry is one of the last large industries to adopt machine methods and to receive its benefits, but it is rapidly becoming one of the leaders in mechanization. The coming Cincinnati Exposition offers one of the greatest mining machinery marts in history. Modern production methods demand men AND machines. Recognizing this fact the coal industry of tomorrow will be a completely mechanized industry.

Of Timely Interest

THE MINING INDUSTRY is one of the most substantial of American producers. Its products utilized in hundreds of allied industries find their way into practically every phase of every-day life. We frequently have pointed out that the mines of the country furnish a livelihood for more than 25,000,000 persons. As mining is encouraged, as new properties are opened, as old producers' markets expand, so expands the industrial life of the United States. Just what does the opening of a mining property mean to a community? Recently the San Antonio Gold Mines, Ltd., of Canada, issued a statement upon "the value of a gold mine to those other than its owners." They say: "San Antonio, 1925 . . . rock and muskeg. San Antonio, 1935 . . . a community of upwards of 500 prosperous people, employing modern convenience of electricity, water supply, telephone, school, central heating, hospital, curling rink, . . . and everything to make life pleasant." This property also purchased in 1935 some $139,560.99 of supplies; paid wages amounting to $277,727.80; had a power bill of $53,333.49; purchased $54,146.73 in explosives; paid an income tax of $41,000.00, to which was added a tax of $5,138.75 paid by employes.

Not all companies have such an interesting record, but this statement is a fair indication of the value of encouraging the development of mining.

WHAT EFFECT WILL PRICE REGULATION HAVE UPON MECHANICAL MINING?

By HOWARD N. EAVENSON *

PERHAPS the situation suggested by the title would be more easily visualized had it been expressed in the present, instead of the future tense—as to what effect price regulation *is* having upon mechanical mining. In an industry where the largest unit only controls about 3 percent of the total production, it can easily be seen that price regulation cannot be successful without wage regulation, otherwise there is too much opportunity for wage "chiseling" to meet the similar condition in prices. Wage regulation is settled for the bituminous coal industry by its labor contracts, regardless of any decision about the legality of the "Guffey" Act, and for the immediate future may be dismissed from further consideration as to its effect on price regulation; it is here—and those selling coal at prices below cost will have a hard time maintaining such a policy, unless they want to distribute surplus reserves, if any, this way rather than by the proposed new tax.

Wages are fixed, and on a relatively high scale, which now has reached a point where mechanical loading in many mines can be done much cheaper than by hand. As late as the summer of 1933, hand loading rates were so low that machine loading could not compete with them in most districts, excepting in Illinois, even where conditions were favorable for machines. The increases since that time have completely reversed that condition and in many mines with thick coal and reasonable roof conditions, savings of 20 cents per ton or more can be effected by the use of loading machines. As a result, four large companies alone are spending at least four million dollars for loading machines, conveyors and the necessary tipple equipment for cleaning and preparing the coal, for mechanizing the equipment of a portion of their mines. The manufacturers of this type of machinery have booked orders for many months ahead, in greater volume than they have had for years. While this movement has so far been largely confined to the larger and well financed companies, it will inevitably extend to all that can afford to buy the necessary equipment.

What will be the effect of so much mechanization? As the larger companies usually have the better coal and the best equipped plants, it seems logical that the reduced costs obtainable will tend to increase their share of the available business, and as most companies installing equipment of this kind do it with the expectation of operating double shift, the men displaced by the machines can be taken care of on the extra shift. Unless a large increase in production is needed, a smaller number of mines, mechanically equipped on a double shift schedule working full time, will supply the steady demand, leaving the peaks and seasonable requirements to be filled by the older type of plants.

If this analysis is correct, it would seem to be necessary for all mines to mechanize in order to survive. There are many seams, however, where on account of roof or bottom conditions and partings, the use of loading machines is impracticable and where conveyor mining with hand loading may not reduce costs enough to make its installation profitable, and of course there are many plants whose owners may not be able to finance such improvements. If these plants produce a quality of coal suitable only for steam purposes, their production may be curtailed to that required for local consumption or sold within an area where they may have favorable freight rates. Frequently higher grade coals have some desirable qualities that enable them to command a price sufficient to overcome the cost advantage mentioned, and many of these coals are mined under conditions not conducive to the best machine mining results. Where a seam of high quality can be mined by machine methods at low costs, it will have a great competitive advantage over other coals of equal quality.

With the ultimate condition of having many machine operated mines running double shift at nearly full time, and the remaining tonnage all that is available for the many mines not able to mechanize, for any reason, these must necessarily operate on a short time basis. Any student of the economies of coal mining knows that this means a decided increase of cost, thus increasing the disparity in cost between these and the mechanized mines. The only remedy that can be seen for this is to consolidate groups of mines having nearly the same quality of coal, operate a few of them at full capacity to obtain the lowest possible cost, keep some others open to provide for the seasonal and peak fluctuations, and to allow the remainder to be idle until the growth of the industry requires them to be started again.

It is not expected that this condition will be reached, or the suggested remedy applied, until many companies have suffered much anguish of spirit and many other pains, some caused by excess of speed in keeping ahead of the sheriff. With the present rigid wage scale it will not be easy to absorb losses by wage reductions, although of course that will be tried in many instances.

Variations in wage rates, the reductions of existing differentials between districts and several other factors will influence the conditions described differently in various districts—all of which will help those managing coal properties to realize that the coal industry, like life, "is just one damned thing after another."

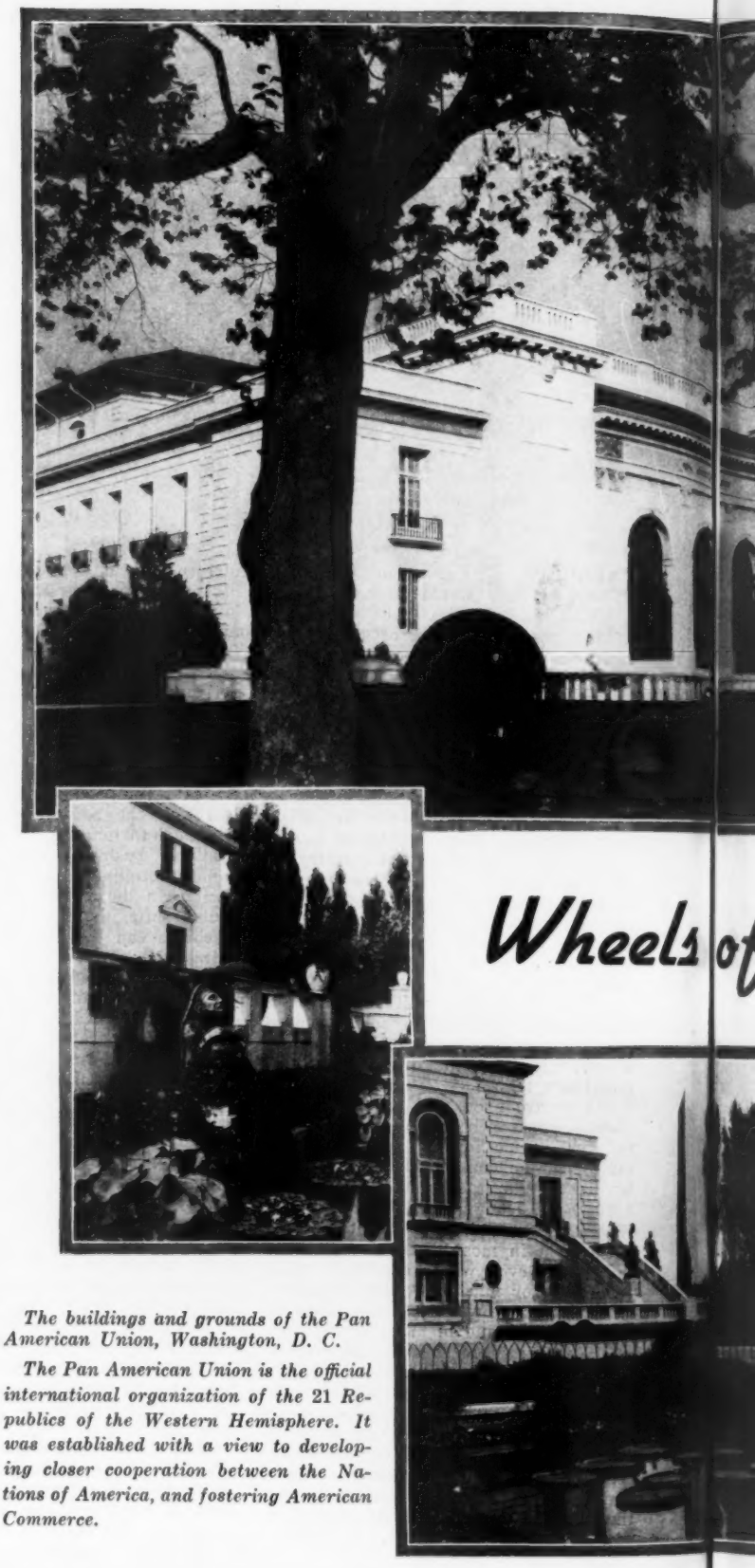
*Eavenson & Alford, Mining Engineers.

ADMINISTRATION leaders are hanging their hopes for an early June adjournment on expeditious handling of the Revenue bill of 1936 (H.R. 12395), reported to the House of Representatives by the Committee on Ways and Means on April 21. Trailing immediately behind the Revenue bill and quite possibly providing incentive for its early enactment is the $1,500,000 relief bill in which members of the majority in the Congress are reported to be deeply interested. Most certainly the Revenue bill, as inspired by the President's message on March 3 is a startling proposal. To abandon a tax yield estimated at $1,100,000,000 for 1937 and to sail forth on the uncharted seas of a tax on undistributed corporation earnings, coupled with the removal of exemption from the normal tax rate on dividends received by individuals is a wide departure.

The proposal to tax undistributed earnings of corporations is not new, having been suggested as far back as 1910. The method has been studied for years by careful and qualified men, including the late Dr. T. S. Adams, of Yale University. Study was given to this type of taxation by the staff of the Joint Committee on Internal Revenue Taxation in the year 1927 and in their report on the subject, the staff stated as follows:

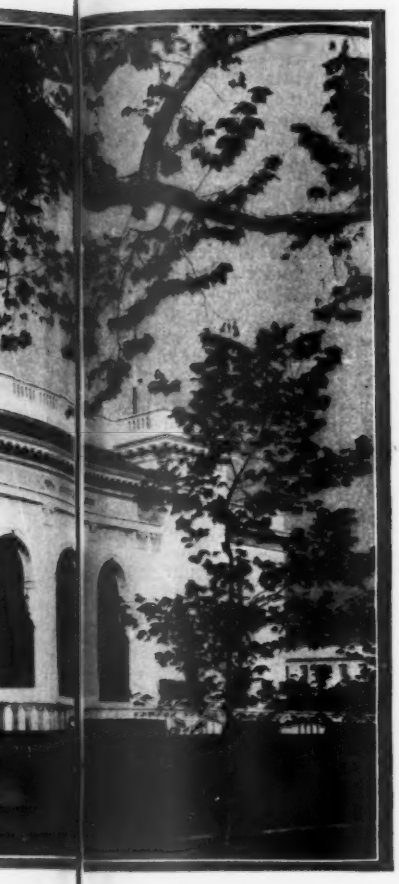
"The most obvious objection to such a tax is the burden which it places on legitimate and proper business expansion. As a business expands not only does its plant and property increase, but a larger working capital is required and it is desirable that reasonable accumulations of profits necessary for the expansion and stability of corporations should not be unduly burdened. * * * It is believed that a tax on the total accumulation of profits by corporations is not desirable, because in many cases it might cause the making of unwise distributions and prevent the accumulation of reasonable and proper surplus."

The Committee on Ways and Means faced a most difficult task in the development of a bill in line with the President's message. The burden fell on the sub-committee under the chairmanship of Sam B. Hill, of Washington. After the development of a sub-committee report, hearings were conducted at which the Treasury Department was represented by Commissioner Guy T. Helvering of the Bureau of Internal Revenue, assisted by the staff. Various representatives of business and industry appeared in opposition to the proposed measure and the hearings closed with violent opposition rendered by representatives



The buildings and grounds of the Pan American Union, Washington, D. C.

The Pan American Union is the official international organization of the 21 Republics of the Western Hemisphere. It was established with a view to developing closer cooperation between the Nations of America, and fostering American Commerce.



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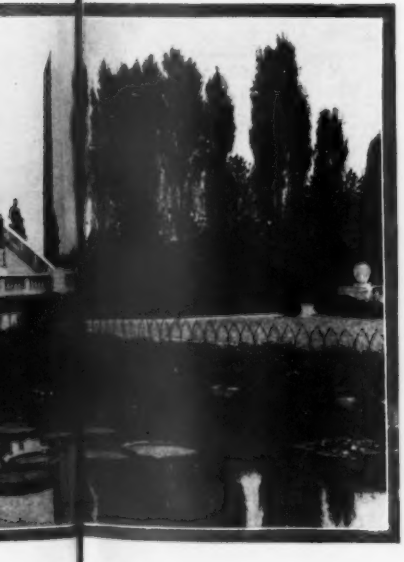


speaking for the United States Chamber of Commerce.

It is of interest to note that one of the few proponents of the proposed bill outside of the Treasury witnesses was a witness who appeared in behalf of the Communist party. After the close of the hearings on April 8, the majority side of the Committee on Ways and Means wrestled with the job of producing a bill for 13 days, including many nights, and the result of their work is expected to be passed by the House of Representatives after 16 hours of floor debate. The bill is intended to force the payment of dividends by corporations through the assessing of taxes ranging from 1 percent to 29.5 percent on dividends retained by corporations earning $10,000 or less. In the case of corporations with earnings above $10,000, the tax on dividends retained varies from 4 percent to 42.5 percent. The tax schedules as contemplated are herewith reproduced.

Additional revenue is provided by delaying for six months the proposed repeal of the capital stock and excess profits taxes, with the capital stock tax reduced from $1.40 to 70 cents per $1,000 of declared value of capital stock. This feature is estimated as adding $83,000,000 to the total yield of the bill.

In the course of the development of the subcommittee's report and throughout the open hearings a great deal of protest was registered concerning the effect of the proposed tax on companies of moderate financial standing or with indebtedness in varying degree. The attempt on the part of the committee to meet this situation is evidenced in the bill by the flat rate of 22½ percent on net earnings to be applied to debt-ridden corporations which are under contract not to pay out dividends pending liquidation of their debts. Corporations having indebtedness as of March 3, 1936, but not having contracts covering retirement may also use the 22½ percent flat rate, but with the requirement that the tax credits be spread over a period of at least five years.

Mineral producers throughout the country are deeply concerned with the difficulties which would be encountered under a tax law such as the above. The problem of finding money for capital expenditure in developing and in plant and equipment is felt to be extremely trying if not prohibitive, and it is felt that there will be a serious retardment of mining enterprise and of the increasing employment of mine labor.

The Committee on Finance of the Senate will begin consideration of H. R. 12395 in executive sessions on April 23. In developing comprehension of what the bill contains, the committee will hear members of Sam B. Hill's sub-committee, as well as representatives of the Treasury and of the staff of the Joint Committee on Internal Revenue Taxation. Public hearings before the Committee on Finance are scheduled to begin April 27 or 28. It is anticipated that the Finance Committee will be extremely critical of the bill as introduced in the House of Representatives and it is thought in some quarters that the ultimate Revenue bill of 1936 may contain an increase in the corporation tax rates under the 1935 act, together with moderate additional taxes on undistributed earnings and some measure of the type of processing taxes outlawed by the Supreme Court decision on the AAA.

Price Differential Legislation. The Patman price differential bill (H.R. 8442) spoken of as an anti-chain store bill, is still in a controversial situation in the House. Activity at the present time centers around the attempt to secure the granting of a rule for floor consideration by the Committee on Rules. On April 20, 80 members of the House met in the caucus room of the Old House Office Building and organized a steering committee supplemented by four additional committees for the announced purpose of securing passage of the bill. In speaking on the floor of the House the same day against the Patman bill, Representative Dirksen (Rep., Illinois) said:

"Perhaps a great many members of the House are not aware of the fact that paragraph (5) of section 2 of H. R. 8442, known as the Robinson-Patman bill, is in reality a paragraph which deals with the whole question of so-called 'basing points' and should be stricken from the bill. This section does not belong in the bill, and its removal would not prejudice the rest of the measure. Moreover, both the Interstate and Foreign Commerce Committee of the House and the Interstate Commerce Committee of the Senate have been dealing with this matter in a wholly separate measure, known as the Wheeler-Rayburn bill, and therefore the incidental treatment which is accorded to the whole 'basing point' question in H. R. 8442 should be stricken out. Quite aside from that fact there are a host of reasons why the basing-point section should be stricken from the bill, and I shall enumerate them as briefly as possible.

"Paragraph (5), on page 7 of the bill, reads as follows:

'That the word "price" as used in this section 2 shall be construed to

New Tax Schedules

Following is the proposed corporate tax schedule covering companies with $10,000 net income or less. Column 2 gives the percentage tax rate on corporation net income withheld from distribution as dividends. It is based on the percentage of such income withheld, as shown in column 1.

Col. 1	Col. 2	Col. 1	Col. 2	Col. 1	Col. 2	Col. 1	Col. 2
0	...	18	3.00	36	10.80	54	20.70
1	0.10	19	3.25	37	11.35	55	21.25
2	0.20	20	3.50	38	11.90	56	21.80
3	0.30	21	3.90	39	12.45	57	22.35
4	0.40	22	4.70	40	13.00	58	22.90
5	0.50	23	4.30	41	13.55	59	23.45
6	0.60	24	5.10	42	14.10	60	24.00
7	0.70	25	5.50	43	14.65	61	24.55
8	0.80	26	5.90	44	15.20	62	25.10
9	0.90	27	6.30	45	15.75	63	25.65
10	1.00	28	6.70	46	16.30	64	26.20
11	1.25	29	7.10	47	16.85	65	26.75
12	1.50	30	7.50	48	17.40	66	27.30
13	1.75	31	8.05	49	17.95	67	27.85
14	2.00	32	8.60	50	19.50	68	28.40
15	2.25	33	9.15	51	19.05	69	28.95
16	2.50	34	9.70	52	19.60	70	29.50
17	2.75	35	10.25	53	20.15		

Following is the proposed schedule for corporations earning more than $10,000 annually:

Col. 1	Col. 2	Col. 1	Col. 2	Col. 1	Col. 2	Col. 1	Col. 2
0	...	15	6.5	30	15.0	45	30.0
1	.4	16	7.0	31	16.0	46	31.0
2	.8	17	7.5	32	17.0	47	32.0
3	1.2	18	8.0	33	18.0	48	33.0
4	1.6	19	8.5	34	19.0	49	34.0
5	2.0	20	9.0	35	20.0	50	35.0
6	2.4	21	9.6	36	21.0	51	36.0
7	2.8	22	10.2	37	22.0	52	37.0
8	3.2	23	10.8	38	23.0	53	38.0
9	3.6	24	11.4	39	24.0	54	39.0
10	4.0	25	12.0	40	25.0	55	40.0
11	4.5	26	12.6	41	26.0	56	41.0
12	5.0	27	13.2	42	27.0	57	42.0
13	5.5	28	13.8	43	28.0	57.5	42.5
14	6.0	29	14.4	44	29.0		

mean the amount received by the vendor after deducting actual freight or cost of other transportation, if any, allowed or defrayed by the vendor.'

"In practical language that section means that all sellers or vendors of commodities will be compelled to quote prices f. o. b. instead of the delivered price. That this is the purpose of the section is borne out by the language of the report accompanying this bill, as indicated at the bottom of page 14 of said report, which contains the statement: 'It will require the use of the f. o. b. method of sale.'

"This means f. o. b. the mill, plant, factory, or establishment which produces the goods.

"The 'basing-point system' of quoting prices on commodities which is now in vogue in many industries is nothing more than a system under which prices are quoted to consumers f. o. b. certain convenient points, which are either points of manufacture or points of distribution. As an example, Chicago is a basing point. If a purchaser in Peoria wishes to buy steel, cement, or other products, he is quoted f. o. b. Chicago. This system of quoting from the nearest basing point gives all mills, whether located near or far away, an equal chance to compete for the business."

In the Senate the Robinson bill, which is similar to the Patman bill, is on the calendar and Senator Robinson is reported as having expressed his intention of awaiting House action before proceeding further.

The *Wheeler anti-basing point bill* in the Committee on Interstate Commerce of the Senate, is still the subject of hearings which may continue until the end of this session of the Congress.

Healey Government Contracts Bill. This measure is still in a controversial situation before the House Committee on the Judiciary. It has been rewritten in Sub-committee so as to be applicable only on contracts or purchases of $10,000 (previous limit was $2,000); to establish a Public Contracts Board of three members in the Department of Labor with authority for the administration of the Act, with the proviso that its rulings shall not be reviewable by the Secretary of Labor; to give the board power to recommend that no contracts be signed for a 3-year period to firms which breach provisions of the Act; to bar so-called "home-work" and "sweat shops"; to make it mandatory upon the board, in fixing minimum wages and maximum hours, to take into account living conditions and all other relevant factors; to require that the board's inclusion of wage and hour requirements in contracts shall affect only such industries as have been the subject of a determination thereon by the board.

Interior Department Appropriations Bill. On April 16 the conferees reported this bill which contains the appropriations for the United States Bureau of Mines and for the United States Geological Survey. The results which have been accepted by both the House and Senate and which it is anticipated will be approved by the President, are herewith set forth:

U. S. Bureau of Mines	1937 Budget Estimate	1937 House Bill	1937 Conferees Report
General Expenses	$ 65,000	$ 65,000	$ 65,000
Operating Rescue Cars & Stations and Investigation of Accidents	609,365	583,215	609,365
Testing Fuel	185,400	165,400	185,400
Mineral Mining	250,860	250,860	250,860
Oil & Gas Investigations	237,866	250,366	265,866
Expenses Mining Experiment Stations	195,450	279,850	279,850
Care, Bldgs. and Grounds, Pittsburgh	87,690	87,690	87,690
Economics of Mineral Industries	309,190	300,490	339,990
Gas Production, Helium Plants	9,179	9,179	9,179
Repair of Gas Well	20,000	.....	.....
	$1,970,000	$1,992,050	$2,093,200

U. S. Geological Survey	1937 Budget Estimate	1937 House Bill	1937 Conferees Report
Administrative Salaries	$ 128,060	$ 128,060	$ 140,000
Topographic Surveys	440,000	440,000	650,000
Geological Surveys	488,000	488,000	500,000
Mineral Resources of Alaska	70,000	60,000	60,000
Gaging Streams	660,000	660,000	791,317
Classification of Lands	100,000	100,000	100,000
Printing and Binding, Preparation of Illustrations, Engraving and Printing Maps	251,500	251,500	251,500
Enforcement of Mineral Leasing Laws	225,000	225,000	315,000
	$2,362,560	$2,352,560	$2,807,817

Of All Things . . .

For the last three years the country has had a lot of fun kidding the New Deal about its brain trust, that corps of professors who devise many Administration policies. . . . But there must be something to them, after all. . . . The Republicans surprised Washington the other day with a "brain trust" of their own. . . . The latter, however, are sadly outnumbered. . . . Theirs is only a baseball team—nine. . . . The Administration has a veritable Notre Dame squad . . . five or six football teams headed by the brainy quarterback . . . Felix Frankfurter. . . .

This is certainly the "searchinest" Congress ever. . . . With something like a dozen Congressional investigations running, it now has turned its activites back to 1776. . . . It wants to find out if "the shot that was heard around the world," which began the Revolutionary War, was fired at Concord or at Lexington. . . . It oughtn't to take more than a $100,000 appropriation to uncover that fact inasmuch as more than half a century ago a monument was put up at Concord at the very spot the first shot was fired. . . .

The President intends to have plenty to take care of relief needs for the coming fiscal year. . . . He asked for one and one-half billion dollars in new appropriations, explaining that with what is left over from this year, the Administration will worry along. . . . Now it develops that latest figures show $1,128,000,000 will be left over. . . . Which means a relief fund of $2,628,000,000 for the new year, just seven hundred and fifty million dollars less than expended this year. . . . Less, that is, if one disregards the two billion dollar bonus, the two hundred million dollar increase in various appropriation bills so far added by the Congress, the several hundred millions in the "regular" budget for public works and similar relief work. . . . All in all, it mounts to a tidy sum. . . .

The latest dope about adjournment is that the Democrats promised the Republicans that adjournment would be early enough to allow the latter to attend their national convention on June 9 with Congressional cares behind them. . . . The rumor that comes on top of this is that Senator Black's committee is going to investigate what seems to be collusion between Democrats and Republicans. . . .

Every Administration leaves behind it one or more monuments to which later generatoins point. . . . The last one left the Boulder Dam and the ornate Commerce department building. . . . The present one has left two of its monuments in Florida and Maine. . . . In the former is a five and one-half million dollar scar across the central part of the State. . . . in the latter is a deserted village and some blue prints representing seven million dollars spent on a tide-harnessing project. . . .

Who says Congressmen aren't getting smarter? . . . In years gone by a tax committee used to spend at least a couple of weeks studying a new tax bill before reporting it for enactment. . . . Nowadays the same committee requires only three days to know intimately a 250-page involved revenue measure . . . blandly tells the Congress that the Committee has studied and knows the measure and recommends it be passed. . . .

The New Deal, says its proponents, is the farmer's best friend. . . . So the President vetoed a seed-loan bill and diverted eighteen million dollars of relief money for that purpose. . . . Now it develops that more than half of the seed loan applications got lost in the tangle between Agriculture, WPA, and Resettlement. . . . Protests flooded Senators. . . . There was threat to override the veto on the seed loan bill. . . . Then things began to happen. . . . Along late in April and early May farmers began to receive seed loan checks. . . . So the New Deal remained the farmer's best friend, even if it was a month after planting time. . . .

Next year's appropriation bills disclose some interesting facts. . . . The Navy will be able to spend a little more than one and one-half million dollars a day . . . the State department will have $42,000 a day . . . FERA will have 82 cents a day per family for direct relief. . . .

How the mighty are fallen! . . . Once NRA had 12,000 employes and half of the office space in Washington. . . . Now there are 21 men and 20 women—all former division chiefs—left on the staff. . . . Of course, officially NRA was killed nearly a year ago. . . . But for the final cleaning up the generals have been retained . . . the soldiers dismissed. . . .

MODERN EXPLOSIVES in Industry

By J. BARAB*

HIDDEN in the background of America's great industrial expansion is dynamite, the greatest boon that has ever been created for overcoming the obstacles of Nature. Until the advent of dynamite in 1867, conditions in this country were nearly as crude as when Columbus first set his foot on American soil in 1492. The 350-year interval saw little improvement in transportation facilities, in the construction of roads, or in the mining of coal, iron, copper and precious metals. No skyscrapers studded the skylines of our cities; harbors were unsafe for large ships. It was only when dynamite made its entrance that our industrial expansion began on a scale never before witnessed in the history of the world. Dynamite made possible the construction of railroads over and through mountains. No other force could have removed the rocks endangering navigation, such as at Hell Gate, in New York Harbor. Dynamite has made possible large-scale mining of the metals that are most important in our industrial expansion, for without iron, steel, copper, gold, silver, lead, and zinc, our civilization could never have advanced to its present state. Only by the help of dynamite are smooth roads, great irrigation projects, huge mining operations, great power developments, and the thousand and one conveniences of modern life made possible.

Let us consider a few important facts: In 1860, only 62,000 ounces of silver were produced in the United States; in 1870, just after the introduction of dynamite, 10,000,000 ounces were produced. In 1890, 55,000,000 ounces of silver were mined in America. Are these figures not eloquent testimonials of dynamite?

In 1869, before dynamite had been regularly adopted as a mining agent, only 72,000 tons of copper ore were mined in the United States; in 1920, 18,000,000 tons of copper ore were produced. This tremendous production would have been impossible without the use of explosives. As for iron, in 1920 about 68,000,000 tons were produced, besides vast tonnages of lime rock for flux and coal for the production of coke; this compares to only 500,000 tons of iron produced in 1860 before the advent of dynamite.

But dynamite, despite its revolutionary effect on industry, is today far more convenient and satisfactory than the dynamite of 1870. In place of the original dynamite, explosives chemists have devised a series of explosives to meet economically, efficiently, and safely the particular demands of any industry. Regardless of the type of rock, ore, or coal encountered, regardless of conditions of mining, there are explosives exactly suited for these various requirements, and research chemists are continuing their studies to develop explosives of even greater efficiency, greater safety, and greater economy.

This brings us up to modern explosives. By modern explosives we mean those based on the true principles of giving maximum execution combined with greatest economy and greatest safety. Some of these explosives may be old in principle, but they represent in themselves the best combination of ingredients for certain purposes. On the other hand, these explosives may be comparatively new, embodying the latest developments of the research laboratory and proved in the field as capable of performing important work at lower cost than the types of explosives they replace.

For example, let us consider two contrasting types—gelatin and gelamite. One of the older types of explosive is the true gelatin. Its fumes, execution, and water resistance are such that wherever this type of explosive is required, nothing can take its place. Yet old as gelatin is, it is a modern explosive in the sense that it is made to strict specifications with exacting care and of the finest ingredients available.

The gelamites represent another type of modern explosive. They were developed in 1929 to replace gelatin where extreme water resistance of the gelatin was not required. For most work, they are just as satisfactory as the gelatins and are considerably cheaper, and are also safer to handle and to use. However, in extreme conditions, gelatin is more satisfactory. Thus, the gelatins and gelamites are good examples of contrasting modern explosives, according to the interpretation of this discourse.

A modern explosive, according to some interpretations, might mean a new and different explosive with novel features. Just because it is new—just because it is different—just because it is novel—is no reason why it should be termed "modern." By this definition, coal could not be considered a modern fuel, iron could not be considered a modern construction material, copper could not be considered a modern metal. Yet we know that these materials—copper, iron, and coal—are definitely more important

Phelps Dodge Operations at Sacramento Hill, Bisbee, Ariz.

* Manager, Service Division, Explosives Department, Hercules Powder Company, Wilmington, Del.

in our industrial scheme than many materials that can be recommended only on the basis that they are new and novel. We will have the old metals with us for many more years; likewise, tried and true explosives are a definite part of our industrial life.

A modern explosive, therefore, should mean an explosive that is well adapted to blasting needs—one which can prove its superior worth on merit alone.

You are, no doubt, interested primarily in the modern explosives of the newer type that give the greatest economy, efficiency, and safety. These are the explosives that were born in the research laboratory and are being generally adopted by industry. These are the explosives that are making possible great savings in mining, quarry, and construction today. These, in a strict sense, are the modern explosives. They represent not only careful manufacture but they represent intelligent, thoughtful research that has for its objective the lowering of explosives costs. These explosives help to make possible the mining of lower grade ores. They make possible great strides in mining. These lower cost explosives help to swell our mineral production, because they allow mines to operate which otherwise might be closed.

Our own brand names for these modern, lower-cost explosives, particularly adapted to the metal mining industry, are the hercomites and the gelamites, both high in ammonia content.

Naturally, lower costs, additional safety, and better execution are desired by mine operators. Getting these important results is not in itself a simple matter with any explosive, old or new. This is especially true of large operations where every item of cost must be reduced to a minimum to make a profit on low-grade ores.

It isn't a case of walking in a candy store, for instance, and selecting chocolates for 40 cents, 60 cents, 80 cents, or a dollar a pound. No, the problem is to determine which explosive is best for mining under existing conditions. It may be the most expensive per pound—or it may be the cheapest. The main idea, however, is to select the correct explosive and use it properly. So, whether the explosive is old or new, it must be carefully chosen as best adapted for the work to be done and must also be correctly applied.

How to Select Explosives

In the early days it was easy to select an explosive. There were two types—black blasting powder and kieselguhr dynamite—take your choice. It was as simple as that. Now, however, there is a veritable galaxy of explosives, varying in strength and physical properties, compounded in various ways, and designed to meet the many different conditions encountered in blasting. Even with these, if the thought is kept uppermost that selection should be based on merit—on execution, economy, and safety—the task of selection is not extremely difficult.

For a more thorough understanding of these factors—safety, economy, and performance—let us consider them individually.

Safety

"Safe" and "safety" are relative terms when used in connection with explosives. No explosive is absolutely safe in the true meaning of the word. Explosives are made to explode: they can be made to explode under control, but any explosive is dangerous if not used or handled properly.

As applied to explosives, safety includes not only the explosive itself but also its handling, its use, and conditions existing after its use. In general, the least sensitive explosives offer the greatest degree of safety in handling. It must be borne in mind, however, that extreme insensitiveness sometimes makes additional hazards because of probable misfires and incomplete detonation, and greater quantities of poisonous fumes. If an explosive is so insensitive that it requires a powerful primer, it is no less safe than the sensitive primer. Safety, therefore, means a combination of sufficient sensitivity to detonate completely; sufficient insensitivity so that when properly handled, danger is reduced to a minimum, and—and this is very important—correct methods of handling and using explosives on the part of the operator.

Stability.—Stability and uniformity in composition are absolutely necessary if blasting is to be conducted on a relatively safe and scientific basis. An explosive should remain stable; that is, it must not explode spontaneously, or deteriorate appreciably over a reasonable period of storage in a suitable magazine. Its quality should be dependable and uniform.

Concentrator of the Phelps Dodge Corporation, Bisbee, Ariz.

Execution

The chemical and physical properties of an explosive determine, in a large measure, its capabilities. As these properties are "built in," it is imperative that explosives be selected from manufacturers who exercise great care in the making of their products—and who have the necessary research, physical and chemical control, manufacturing skill, and testing facilities to make certain that their explosives measure up to the high degree of uniformity and high quality required by modern industry.

In considering the properties of explosives that affect execution, the following are probably most important:

Strength—weight and bulk.
Sensitiveness.
Stability.
Rate of detonation.
Water resistance.
Consistency.

A short discussion follows on each:

Strength.—Too much care cannot be exercised to select an explosive of just that strength which is best suited for a given operation. Very often a low-strength explosive will do more effective work than a high-strength dynamite. On the other hand, there are many times when a slightly higher strength dynamite will prove the most economical. Distribution of a charge in the bore hole is an important factor often overlooked. In pulling a heavy burden, such as in cut holes in driving tunnels, it is important that sufficient explosives energy be concentrated in the back of the hole; it is equally important that the explosive not extend too near the collar of the hole. On the other hand, in slabbing or rib shots, best execution usually is obtained when the explosive charge is well distributed through the hole. Thus, in the first instance, a dense, high bulk strength explosive is required, while in the latter case low bulk strength explosives are best.

Sensitiveness. — The sensitiveness to propagation of an explosive is extremely important. An explosive should be sufficiently sensitive to insure complete detonation throughout the entire length of the charge by the use of a standard No. 6 detonator, but sufficiently insensitive so that it may be transported and handled with relative safety.

Rate of Detonation.—The rate of detonation at which an explosive develops its maximum energy is another important consideration. The available commercial explosives embrace velocities over a wide range. In general, where a shattering effect is desired, an explosive with a high rate of detonation is desirable; while where a heaving or rending action is wanted, a slower explosive should be used.

Water Resistance.—Explosives vary considerably in their water-resisting properties. The high-strength gelatin dynamites, for example, will withstand immersion in water for long periods without appreciable effect upon their effectiveness. The straight nitroglycerin dynamites will detonate after appreciable periods of immersion in water, but change their characteristics according to the amount of water absorbed.

Consistency. — Explosives are available that are as free running as dry, coarse sand in one extreme, and, at the other extreme, are as cohesive as raw rubber. Either extreme condition requires the sacrifice of some important consideration. Extreme free running reduces efficiency of detonation to some extent. Rubbery consistency increases the cost of the explosive. Of the explosives available today, the greatest efficiency and economy are obtained in the high ammonia content explosives, which are somewhat cohesive, or in the gelamites, which are cohesive but only slightly plastic.

With these facts in mind, it should not be difficult to determine the consistency necessary for any specific condition.

These are the principal considerations from the standpoint of the consumer. For a well-balanced explosive, many other important details must be studied.

Selecting an explosive to give best execution, after consideration of all these factors, does not mean, necessarily, that good execution will result. It is of prime importance that the explosives be used correctly to obtain best results. Unless there is previous experience for guidance, the chances are that a number of trials, carefully supervised, will be necessary to determine the proper procedure for effective execution.

It is not to be inferred that there is only one explosive that will give satisfactory execution for a particular job. Often several different explosives, sometimes varying widely in properties, will give entirely satisfactory execution if used properly. The methods of using, such as loading ratio, spacing of holes, method of placing charges, and similar technical details, may need to be altered to obtain the best execution possible with different explosives.

Economy

Most operators are aware of the value of safety and the worth of efficient blasting; but, after all, profits are of vital importance. Profits come from efficient operation and from safety also, but economy of explosives is likewise a contributing factor. A brief study of this important phase of blasting discloses some important points.

One fact stands out—it is easier to select an explosive to give good execution than it is to select one to give utmost economy. Good execution often can be obtained from several different explosives, but a study of costs usually shows that a certain one is decidedly more economical.

Economy is not the cost of the explosive per 100 pounds. This is important, of course, in determining economy, but is misleading if considered alone. Many factors enter into economy, and a careful accounting of all facts are necessary to obtain true comparative costs. This is especially true if the explosives compared are widely different in properties.

The cost of explosives per ton or cubic yard of properly blasted material is the true basis of comparison. To arrive at the correct cost figure, consideration should be given to some of the more important factors that are related to explosives economy. Some of these items are listed:

1. Cost of explosive per ton or cubic yard of material.
2. Drilling and loading costs.
3. Differences in cost of handling the broken ore or rock.
   (a) Cost of labor and explosive for secondary shooting if required.
   (b) Any difference in production delays incident to the use of explosives.
   (c) Any difference in cost of labor, machinery, and power caused by the character of breakage.
4. Differences in processing costs.
5. Waste material or material of less value.

Some of these items should be subdivided further, and a comprehensive study would be considerably more elaborate, but for general conditions, these factors are of primary importance. It must be remembered that each mining operation has its peculiar blasting problem; an explosive suitable for one mine is not necessarily best adapted for an adjoining property. Differences in equipment, in mining methods, in type of ore, method of loading, etc., are among the items that may require a change in explosives.

Balancing Factors for an Economical Explosive

All of the factors that go to make up explosives economy must be considered as a whole.

Operations with larger equipment can handle larger material than properties with smaller equipment. These operations may find it advantageous to lower drilling costs by increasing the spacing of holes, by using a lower loading ratio, or even by using a different explosive. The breakage necessary to give the best economy must be studied.

In this connection, the following case is cited: In a certain mining section, the ore formation was such that it could be dug in open pits with large steam shovels without blasting. After exhaustive trials, it was found that proper blasting increased the production of each shovel and the resulting efficiency made a saving more than enough to offset the additional blasting costs. Besides, milling costs were reduced because the material was fractured better.

Another consideration that affects economy is the selection of explosives with special properties. Certain properties can be incorporated into explosives only at additional expense. These special properties should give the explosive consumer definite benefits commensurate with their increased cost, to justify their use. Consider water resistance, for instance: Proper attention is not always given to the necessity of water resistance, and this deficiency is not confined entirely to the small consumer. In some mines, explosives are used under conditions which are too severe for their water resistance. This results in poor execution or complete failure of the shot. At other properties, highly water-resistant explosives are used unnecessarily. This results in higher costs and could be obviated if a less water-resistant type of explosive were used. This error is one of not keeping abreast with modern explosives development. The chances are that more expensive water-resistant explosives were necessary at one time but changed conditions now make them unnecessary with the development of sufficiently satisfactory water-resistant explosives offering better explosive value.

Here is another important economy consideration: Certain types of explosives require an investment by the consumer in special equipment, or an entire plant. In such cases, the life of the equipment, repairs, and amortization of the investment must be figured in true explosives costs and considered for comparison in arriving at real explosives economy.

If increased supervision is employed in blasting operations, this increased expense is chargeable to the explosive economy and must be justified by some improvements. In general, this will pay good dividends. Instances can be cited showing that a change in explosives, simultaneous with increased supervision, resulted in savings that were attributed to the change in explosives. As a matter of fact, the same improvement might have been effected with the explosive previously used.

Trend in Production of Best Explosive Values

Certain desirable possible explosive ingredients, known to chemists, are not used commercially because of their relatively high cost. Until such raw materials are reduced in cost or improvement in their manufacture is made, they will not come out of the laboratory—for our modern explosives must have commercial value at comparable or lower costs than those in use.

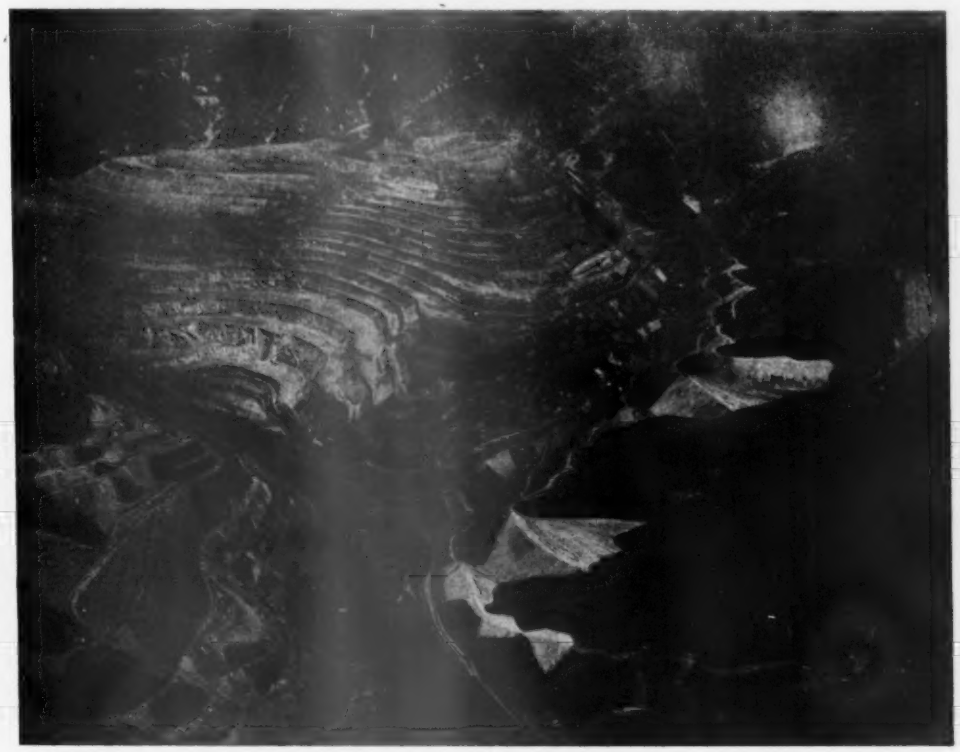
In recent years, the trend in explosives development has been toward explosives with lower nitroglycerin content; the nitroglycerin being replaced by other less expensive explosive ingredients. This has made possible better explosives values and corresponding economy for operators. The sales of these more economical explosives have increased and at the same time a number of desirable properties have been attained in explosives by these substitutions. Unquestionably, these explosives, wherever they can be used, offer greatest value for metal mining, when properly selected and used.

The hercomites and gelamites are typical of these better explosive values. Sufficient nitroglycerin has been retained in the formulas to give necessary sensitiveness. As previously mentioned, too high sensitiveness increases the danger from their use. Over 200,000,000 pounds of our hercomite-type explosives have been used without a report of a premature explosion caused by the explosive. Their relative insensitiveness to flame, shock, friction, and impact makes them among the safest commercial explosives. Yet these explosives, with such a remarkable safety record over a long period of years, can be depended upon to detonate completely if properly primed with a standard No. 6 detonator.

These explosives are all manufactured with the highest weight strength that it is practical to obtain with this type of powder. The weight strengths are higher than the strongest grades of straight nitroglycerin dynamite or the older type of ammonia dynamite, generally referred to as Extra dynamite. The gelamites are of more recent introduction, but their record is equally free from premature explosions.

By making these explosives with different densities (cartridge counts) a series is formed with varying cartridge strengths. The hercomites can replace extra dynamites with equal execution and at a saving. Similarly the gelamites, which are semigelatins, can replace gelatins, except under the more severe conditions, at a saving. At the

(*Concluded on page* 81)



Utah Copper Co., from the air.

Coal's Convention a

THE dates—May 11 to 15—are red-letter days for the coal industry. All plans throughout the production districts are definitely directed toward Cincinnati and the Thirteenth Annual Convention and Exposition of The American Mining Congress. Everything is in readiness: The program is complete, and offers a very fine group of papers upon subjects about which every coal operator is interested to learn more. The exposition is replete with the latest equipment to help the industry achieve greater efficiency in production. The hotels are in readiness, and the various groups responsible for this year's meeting are ready and anxious to make the event one of outstanding importance.

Much credit goes to R. E. Salvati, general manager, Island Creek Coal Company, and chairman of the program committee, and to Charles B. Officer, vice president, Sullivan Machinery Company, and chairman of the manufacturers group, for the remarkable results they have been able to produce. Assisting Mr. Salvati is an industry-wide committee, composed of 73 coal operators. These men have worked diligently since the first of January to present a well-rounded program, and the program presented elsewhere in this issue is definite evidence that they have done a very fine piece of work. Mr. Officer has had the assistance of 46 members of the Manufacturers Section of The American Mining Congress in the development of the exposition, and has set an enviable record. As a result of their efforts all space on the main exposition floors has long been under contract, which made necessary the utilization of second floor space for the first time in the history of these expositions.

This convention and exposition is directed by and a part of the Coal Division of The American Mining Congress, headed by E. J. Newbaker, vice president, The Berwind White Coal Mining Company. Members of the Board of Governors of the division are:

Thos. G. Fear, assistant to president, H. C. Frick Coke Co.; T. M. Dodson, vice president, Weston Dodson Company; S. B. Johnson, president, Lorain Coal & Dock Co.; T. D. Lewis, general superintendent, Lehigh Navigation Coal Co.; G. P. Bartholomew, Coal Department, American Smelting & Refining Co.; R. L. Ireland, Jr., vice president, Hanna Coal Co.; A. J. Musser, vice president, Clearfield Bituminous Coal Corp.; L. N. Thomas, vice president, Carbon Fuel Sales Co.; R. E. Taggart, president, Philadelphia & Reading Coal & Iron Co.; T. J. Thomas, president, Valier Coal Co.; and Otto Herres, vice president, U. S. Fuel Company.

While this meeting is an important part of its work, the studies of the division relating to modern mining methods, practice and equipment are attracting wide attention. G. B. Southward, mining engineer for the division, is in charge of the "Project Committees" work. The committees have been very active during the past six months and have an interesting array of reports which have been presented for consideration. Their report on drainage appears in this issue of THE MINING CONGRESS JOURNAL.

Mr. Newbaker has been chairman of the division for the past two years, and under his leadership it has grown in size and importance.

Mr. Salvati inaugurated a new plan in the development of the program for the 1936 convention. Each state chairman, serving with him on the program committee, was completely responsible for the papers presented from the state. So many suggestions were presented by the industry generally that the committee's real task was in the selection of the final papers. It required many meetings of the state and the national groups to finally select the papers which will be presented. The state chairmen assisting Mr. Salvati, are:

C. E. Cowan, vice president, Monroe Coal Mining Company, for Pennsylvania; W. F. Hazen, general superintendent, Wheeling Township Coal Mining Company, for Ohio; T. J. Thomas, president, Valier Coal Company, for Illinois; Wesley S. Harris, president, Bicknell Coal Company, for Indiana; Henry F. Warden, general manager, American Coal Company of Allegany County, for West Virginia; R. E. Galbreath, superintendent of mines, Wisconsin Steel Company, for Kentucky; A. H. Reeder, general superintendent, Stonega Coke and Coal Company, for Virginia; L. Russell Kelce, vice president, Hume Sinclair Coal Mining Company, for the Strip Operators; and D. R. Swem, manager of coal operations, the Northwest Improvement Company, for the western fields.

The Board of Governors of the Manufacturers Section, assisting Mr. Officer, are:

William E. Goodman, Goodman Manufacturing Company; E. F. Carley, E. I. du Pont de Nemours & Co.; R. L. Cox, Jeffrey Manufacturing Company; H. G. Marsh, Carnegie Steel Company; P. H. Grunnagle, Westinghouse Electric & Manufacturing Company; John T. Ryan, Mine Safety Appliances Company; Geo. R. Delamater, The W. S. Tyler Company; Bruce G. Shotton, Henrick Manufacturing Company; E. A. Williford, National Carbon Company; L. W. Shugg, General Electric Company; J. C. Wilson, Ohio Brass Company; Frank E. Mueller, Roberts & Schaefer Company; and Charles C. Whaley, Myers-Whaley Company.

S. W. Blakslee, production manager, Philadelphia and Reading Coal & Iron Company, is chairman of the committee on arrangements, one of the most important groups associated with the conven-

on and Exposition

tion. Assisting him are the following chairmen and their committees:

Welcome to delegates: E. B. Agee, Youngstown Mines Corporation; John T. Ryan, Mine Safety Appliances Company.

Attendance: W. P. Vance, Butler Cons. Coal Company; G. R. Delamater, The W. S. Tyler Company; Frank G. Smith, C. J. Sandoe, P. C. Graney, J. J. Sellers, E. R. Price, L. Russell Kelce, Geo. H. Rupp, T. R. Johns, B. H. Schull, Paul Sterling, D. A. Weber, Arthur Green, Bruce Shotton, A. R. Anderson, E. J. Burnell, A. K. Birch, J. F. Baker, C. P. Daniel.

Floor: W. W. Dartnell, The Valley Camp Coal Co.; M. R. Budd, C. W. Connor, F. F. Jorgensen, M. D. Cooper.

Annual Dinner: C. E. Hough, Koppers Coal Co.; A. S. Knoizen, Joy Manufacturing Company.

Entertainment: W. D. Turnbull, Westinghouse Electric & Manufacturing Co. Monday: L. Russell Kelce, J. R. Ulrich, H. H. Taylor, Jr. Tuesday: R. J. Ireland, H. C. Stelling. Wednesday: H. B. Husband, C. P. Daniel. Thursday: C. E. Hough, A. S. Knoizen.

Publicity: A. Broggini, National Carbon Company, Inc.; H. J. Saladin, W. W. Rodgers, L. J. Ott, Karl H. Runkle, M. H. McWilliams.

Prize Contest: E. C. Reither, Timken Roller Bearing Co.

Mr. Blakslee and his committee are striving for a record in attendance, in the efficient handling of the convention and exposition, and in the entertainment features.

The program includes 44 main papers, with 39 discussions. Those serving as chairmen for the various sessions are:

I. N. Bayless, assistant general manager, Union Pacific Coal Co.; J. D. Rogers, vice president, Stonega Coke and Coal Co.; Harry M. Moses, general superintendent, U. S. Coal & Coke Co.; H. C. Faust, general manager, United Pocahontas Coal Co.; H. L. Griffin, division engineer, Koppers Coal & Transportation Co.; W. L. Affelder, vice president, Hillman Coal & Coke Co.; Peter F. Loftus, consulting engineer, Pittsburgh, Pa.; and K. A. Spencer, vice president, Pittsburg & Midway Coal Mining Co.

An innovation in the handling of papers has been developed by W. W. Dartnell, chairman of the floor committee. Not only will the time for speaking be scheduled and limited, but the entire program from start to finish will receive expert handling. All main papers are allowed 12 minutes each for presentation. All discussions are confined to eight or five minutes each, depending upon the number of discussions arranged. The vast majority will be presented in the five-minute period. The floor committee will make it its business to see that each session moves with dispatch, in order that the maximum may be obtained from listening to papers and viewing the exhibits.

The committee on arrangements has also undertaken to interest the companies sending their men to the convention, to give them definite instructions as to papers they are to hear, and to return with a written report of what they have learned. Many companies are cooperating with the committee to this end, and it is anticipated that greatly increased interest will result.

If the industry has failed to hear about this convention and exposition it surely is not the fault of the publicity committee, headed by A. Broggini, National Carbon Company, who is assisted by H. J. Saladin, Standard Oil Co. of Indiana; L. J. Ott, Ohio Brass Co.; W. W. Rodgers, Westinghouse Electric & Manufacturing Co.; Karl H. Runkle, General Electric Co.; M. H. McWilliams, *Hanna Coal News*.

Many articles have been released to the general press and to the trade press giving full advance information upon the activities of the various committees.

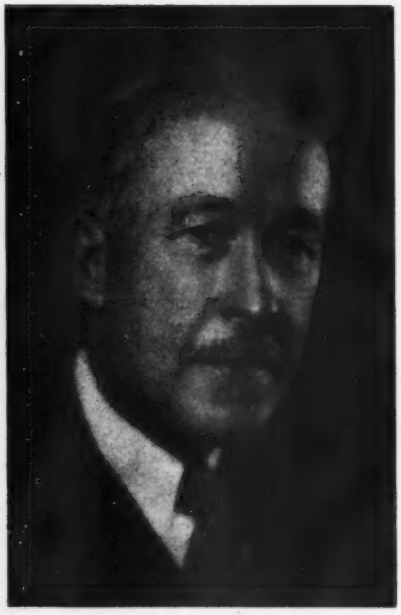
W. D. Turnbull has served as chairman of the entertainment committee and has developed outstanding entertainment, which promises to be one of the main features of the convention. Among other things to be presented by the entertainment committee is a "Miners' National Amateur Hour," where it is hoped to select the finest talent from among our 400,000 miners. Approximately 15 entries will participate, and it is anticipated that real talent will be discovered. One company has advised that it has 100 applicants for an opportunity to represent the company in this competition. The winner of this national contest will be given an opportunity to be heard over the National Broadcasting Company's Red Network on Thursday evening, May 14.

The annual dinner (speechless variety) will be outstanding. Mr. Turnbull and his committee have arranged a most unusual program,

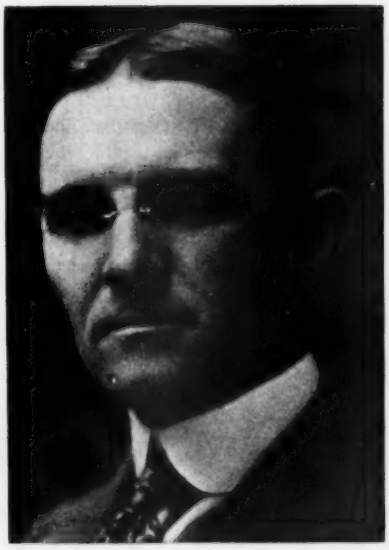
Eugene McAuliffe

W. J. Jenkins

Howard I. Young
President



A. B. Jessup



J. D. Francis

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President
and
Coal Representatives
on Board of Directors
The American Mining Congress

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with Miss Cornelia Otis Skinner as the guest artist. This is an achievement, and sets a real record for this year's entertainment. Among the other features on the entertainment program is the World's Fair famous Old Heidelberg Octette; Ward Wilson, comedian of stage and radio; and McConnell, "Professional Ice Breaker." Every night at 8 o'clock the doors open to an evening of friendliness, of unusual entertainment, and fun. The doors close at 2 a. m. and there seems to be no legitimate reason why everyone attending this convention and exposition may not return home with an abundance of knowledge, plus a happy week among new and old friends.

The exposition is the most important ever sponsored by the Manufacturers Section. In size it excells all other such expositions. Individual exhibitors are making special effort to have their material presented in an interesting and unusual manner. Certainly this great mining machinery mart offers tremendous returns for those who are so fortunate as to visit Cincinnati during the week of May 11.

The General Electric Company has again permitted L. W. Shugg, nationally known authority upon exhibits, to serve as guest-director of exhibits. Mr. Shugg has served in this capacity for the past several years, which has established and which insures the maximum of efficiency in the handling of the exposition.

There are many reasons why the coal operators should attend this year's meeting. In a folder released to the industry late in April, the committee gives the following reasons, which are as good as any, when one considers that there is every reason for the coal man, responsible for efficient production, to be present during the week of May 11. They say:

"Many problems of special interest to every coal producer will be discussed at the convention.

"Every type of mining machine and mine supply will be presented on the floor of the exposition.

"An opportunity to contact operators from every coal producing district, and to learn things of interest from their experience in producing coal safely and efficiently.

"Comparisons of types of equipment, which would require days of travel and inconvenience, if an attempt were made to get this information in any other manner.

"Every progressive coal company and coal man that can possibly do so will be present.

"The convention is a major course in modern mining plus an actual visualization as to how this modern mining may be successfully applied to production problems.

"Men and machines are the answer to many of coal's problems. This meeting offers the maximum of return to every individual participating."

Cincinnati is again opening wide her hospitality. Hotels, clubs, and all related agencies are giving special attention to the needs of the delegates. The Cincinnati Chamber of Commerce has been working closely with the management to assure a smooth-running convention, and J. S. Turner, head of the city's Convention Bureau, has left nothing undone that will insure the comfort and happiness of the delegates in so far as the city is concerned.

Each year the ladies have accompanied the delegates in increasing number. As the fame of the hospitality of the Queen City has become known, the wives and daughters of the delegates have come to the convention. Mrs. Charles L. Harrison, whose civic pride and cooperation are well known, and Mrs. Arthur E. Bendelari, wife of A. E. Bendelari, director of The American Mining Congress and president of The Eagle-Picher Lead Company, are again representing Cincinnati as official hostesses. Each year these charming ladies have opened their homes and given of their time to entertain the wives of the delegates. They are planning interesting entertainment features for this year, to which all visiting ladies will look forward.

Many new things will be presented at the exposition. A list of some of them is found elsewhere in this issue. Among the companies exhibiting, together with the products they are to show, are:

● AHLBERG BEARING COMPANY: A complete display featuring ball bearings, new bearings (the CJB Master Ball Bearings) and reclamation process featured as the Ahlberg Ground Bearings. Will feature a line of CJB Pillow Blocks which incorporate many patented features. First time exhibited to the mining trade.

● AIR REDUCTION SALES CO.: Airco Oxygen, Acetylene, Airco-DB Welding and Cutting Apparatus and Supplies, National Carbide Stoody Products, Wilson Electric Arc Welding Machine and Electrodes, Dry Ice and CO_2.

● ALLIS-CHALMERS MANUFACTURING CO.: Mercury Arc Power Rectifiers showing economical and highly efficient equipment for converting from alternating to direct current for mine substations, and Ro-Twin Air Compressor and the new Low-Head Horizontal Vibrating Screen.

● AMERICAN BRATTICE CLOTH CO.: Samples in book form of seven grades of Brattice Cloth, and Mine Vent Flexible Tubing, also a short section of 8 or 12-inch diameter tubing which will be connected to a Robinson Blower Fan.

● AMERICAN CAR AND FOUNDRY CO.: A complete steel mine car, a display of mine car wheels complete with anti-

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TOPICS THAT WILL BE DISCUSSED . . .

Coal Production Methods—Today and Tomorrow
Progress of Mechanical Loading and Conveyor Mining in All Fields of United States
Coal Cleaning Plant, Northwestern Improvement Co.
Modern Production Methods and Future of Coal
New Things in Mine Safety
Hitch Drill Practice
Portable Mine Car Compressor
Effect of Wide Places on Roof
Our Modern Coal Industry
New Things in Coal Cleaning
Trip Dispatching and Car Movement Records
Power Plant Operation
Driving Rock Tunnels with Shaking Conveyors and Duckbills
Treatment of Tunnel Driving, Anthracite Field
Cutting Bit Treatment
Power Efficiencies
Economics of AC-DC Conversion
Coal Bumps Under Heavy Cover
Aero Mechanics as Applied to Mine Ventilation and Fans
Coal—Modern Servant of Industry
Accident Records: Comparison and Causes of Accidents over Five Year Period
Rock Dusting
Increasing Efficiency in Transportation
Employes Safety Meetings—Open and Closed
Methods of Cutting Out Slate Bands
Prospecting for Coal with Diamond Drills
Coal Cleaning, Peabody Coal Co.
Relation between Life of Entry and Type of Track Equipment
General Use of Power and Energy at the Mine
Welding as a Money Saver
Modern Mining Methods and Coal's Future
High Production in Cutting Machine Efficiencies
Conveyor Mining
New Designs in Car Construction
Modern Production Methods (Talking Motion Picture)
Importance of Efficient Production Methods
Mechanical Loading System
Air Conditioning
Haulage Practice
A Trackless Mine
Welded Rail Joints for Mine Tracks

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friction bearings and sections of different types of wheels, also a moving-picture projector showing on a screen the progress of a mine car from the assembly of raw materials.

● ANACONDA WIRE & CABLE COMPANY: Bore Hole Suspension Unit. Cable and Suspension Unit comes in one piece. It is completely prepared with seamless connectors at factory; therefore, no assembly work is necessary in the field. The other materials featured are new developments in mining machine cables of all types.

● AUSTIN-WESTERN ROAD MACHINERY CO.: Will exhibit Hopper type Trail-Cars with air-controlled doors for motor truck tractor haulage, an air operated working model of a 30-yard Side Pivot, Drop Door, Automatic Air Dump Car, Hopper type Coal Cars—for standard and narrow-gauge track, equipped with air controlled bottom dump doors, various types of Side Dump and Hopper Dump Coal Cars for standard and narrow gauge track, hydraulically operated two-way, side dump, drop door Trail-Cars, for motor truck tractor haulage. All types of machinery and equipment for the construction and maintenance of roads, and in open pit coal mines, using motor truck type haulage will be shown.

● THE AUTOMATIC RECLOSING CIRCUIT BREAKER CO.: Will demonstrate its improved Switchboard and Sectionalizing Circuit Breakers in Booth 505. A 1,200-ampere, 250-volt, Type KSA, Class 2-3 Automatic Reclosing Feeder—Generator Circuit Breaker Panel suitable for semi-automatic or full-automatic substation duty for single unit generators or converters will be shown. For sectionalizing systems within the mine, a 1,000-ampere, 250-volt, Type KSC, Class 2, Automatic Reclosing Circuit Breaker will be available. This is the breaker that has been so widely used throughout the industry during recent years. A complete line of control and protective relays for general mining service will also be at this company's space.

● BETHLEHEM STEEL CO.: A display showing the historical development of mine ties from a standpoint of weight, sizes, shapes, etc. Small sections of the mine ties used in various periods. Several different types of steel mine ties, a steel mine car. This car is made of Mayari iron and Molbydenum steel. The car is an all-welded light-weight mining car with a drop-axle without the outside bearings on the wheels. The car weighs about 3,000 pounds but is sufficiently strong in construction to carry loads just as heavy as those carried by much heavier cars. These new cars are 4 in. lower, and have an additional level-full capacity of 5 cu. ft., than the cars manufactured several years ago by this company. The drop-axle permits lowering the flat bottom of the car to within

(*Continued on page* 63)

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A FEW OF THE NEW THINGS TO BE SHOWN AT THE EXPOSITION:

Automatic balopticon illustrating the story of carbon brushes.

Full size operating model mine locomotive motor illustrating armature floating feature of a precision cylindrical roller bearing at the pinion end.

Methane Detector and an Air Velocity Indicator. Coal spray oils.

Shaker conveyor equipped with a radically new design of carriage and guide frame.

Underground belt conveyor with unique method of adjustable discharge.

Chain and flight type conveyor incorporating unique methods of avoiding breakage, crushing, or jamming of coal at the discharge drive.

Thin cutter bar and chain embracing an entirely new departure in clamping device for secondary cutting bit.

Hopper type tail-cars with air-controlled doors for motor truck tractory haulage.

Working model of chloride wash box.

Aluminum alloy, light weight rail bender operating under an entirely different principle.

Mechanical Loader: Push and pull Type Rail Bender Rerailer.

Automatic Lowering Jacks.

Hot Vapor Coal Treating Equipment in actual operation.

Combined Nut Seal. A new type of sling.

Miners Shin Guards, Respirators, Trip Lamps, Miners Safety Caps.

A line of Pillow Blocks

New Developments in mining machine cables of all types.

Reversible drive transporting coal on the level; latest Shortwall, a Type 512 Universal control fully reversible machine.

Model five track, five grade tipple with shaking screens and picking tables.

Loading Machine, Section of Entry (Belt) Conveyor; Coal Cutter; Super-Aerovane Fan.

New type mine car made with Cor-Ten steel.

Coal mine motor coils; new design of coal tipple.

A thin seam car with unique features for use on inclines and with rope haulage.

And especially developed stub axle car for conveyor loading.

A new, individually packed package for electric blasting caps.

Electric Mounted Coal Drills, Permissible and Open Type.

The new Coalkote "CBO."

Latest motor and control equipment.

Historical development of mine ties—from a standpoint of weight, sizes and shapes.

Small model sand pump, pumping from glass tanks and through glass pipe lines.

Unusual type of steel mine car with wood bumper fillers.

Complete high pressure oil spray pump outfit.

Chilled cast iron track roller, provided with sealed greased-for-life ball bearings.

Part played by lubricants in the up-building of American industry.

A Wire Rope Manufacturing Machine.

A revolutionary new product, namely, Col-Rec.

Mine car stop; mine car skid; mine car derailer; combination splint-stretcher board; Heated First Aid Cabinet.

Super-Weld Rail Bonds.

Six-ton low height trolley mining locomotive; The-silent-operating mercury switch; "steel that floats."

Mercury Arc Power Rectifiers.

Three new coal cutters; together with a modern line of mine type compressors, drills and hoists. Cutter bit sharpening and hard-facing plant.

Cast steel and chilled gray iron wheels; cast steel mine car bottom.

Lubricants under near zero conditions illustrating their fluidity and low pour points.

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R. E. SALVATI,
General Manager, Island Creek Coal Co.,
National Chairman, Program Committee

District Chairmen

W. F. Hazen

Henry F. Warden

Wesley S. Harris

+

Additional Members:

C. E. Cowan

A. H. Reeder

+

R. L. Kelce

D. R. Swem

T. J. Thomas

R. E. Galbreath

Committee on Arrangements

E. B. Agee

C. E. Hough

W. W. Dartnell

W. P. Vance

John T. Ryan

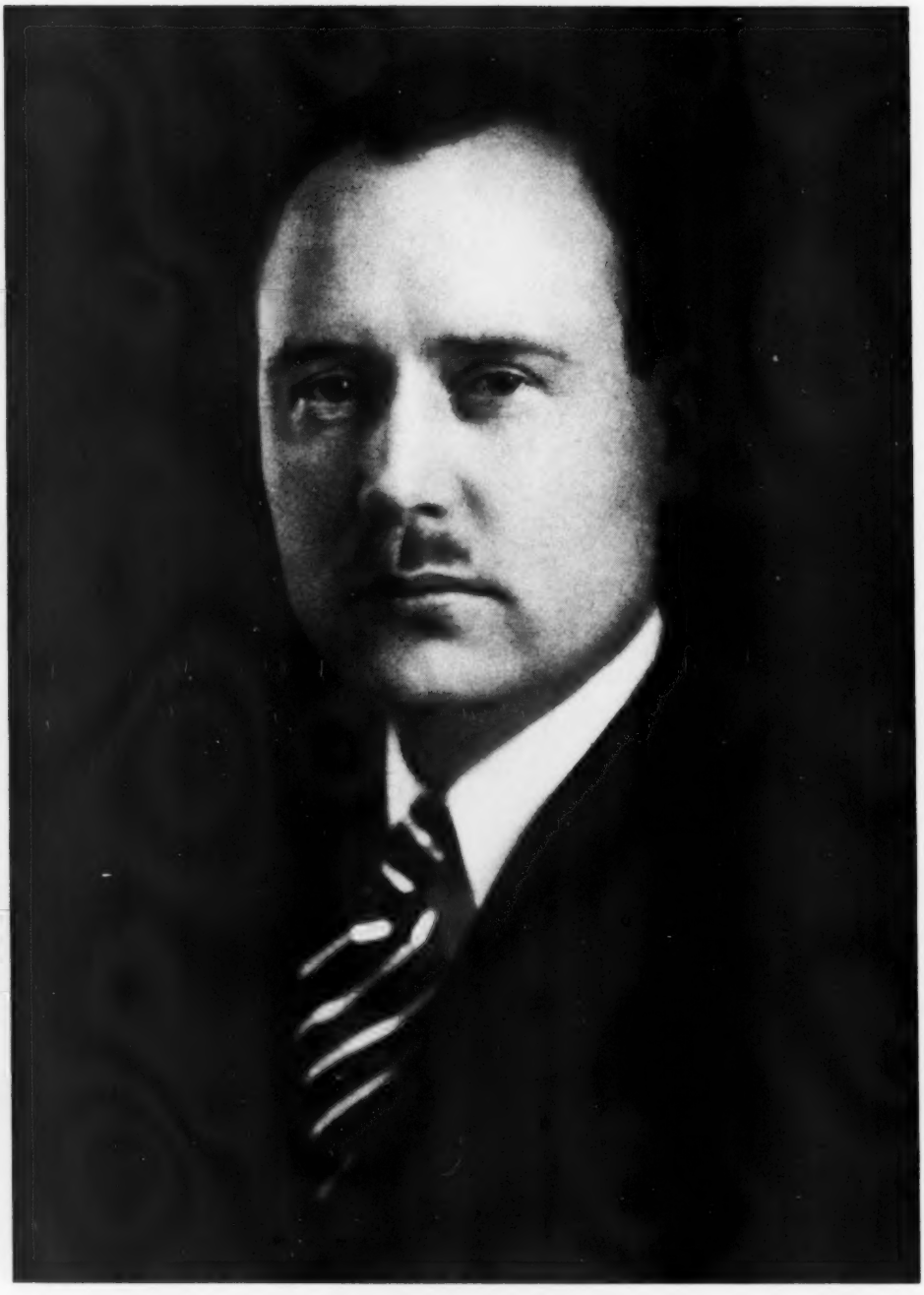
S. W. Blakslee
Chairman, Committee on
Arrangements

W. D. Turnbull

Geo. R. Delamater

A. S. Knoizen

A. Broggini



CHARLES B. OFFICER,
Vice President, Sullivan Machinery Co.,
Chairman, Manufacturers Section, American Mining Congress

2 in. of the lowest rail clearance point and at the same time provides a means for holding the wheels in true gage and alignment and keeping them perpendicular to the track in spite of the flexibility equal to that of four-axle cars. Wheels can drop 1 in. to allow irregularities of the rail level. Forged steel mine car wheels, and two types of steel switch ties will be shown.

● THE BOWDIL COMPANY: Will show their electric transfer motor switches, spike bars, cutter chains and sprockets, also thin cutter bar.

● THE BROWN-FAYRO COMPANY: A complete high pressure oil spray pump outfit with special glass enclosed tank to demonstrate the system of spraying oil on coal or coke for the purpose of dedusting and the prevention of moisture-absorption. Brownie Model HKC slow speed hoist, regularly used for car spotting in connection with conveyor loading system. Brownie Model BB tubing blower, regularly used for auxiliary ventilation in connection with mechanical or conveyor loading systems. Austin-Brownie 4x5 mine gathering pump, ball bearing equipped, totally enclosed, and arranged for flood oiling. This pump will be operating and will have suitable glass windows to illustrate the lubrication system.

A new 6x16 chilled cast iron track roller, provided with sealed greased-for-life ball bearings. Various sizes and types of plain and roller bearing track sheaves, Brownie rerailers and derailers for various rail sizes. Chilled cast iron mine car wheels of various sizes and designs.

● CHICAGO PNEUMATIC TOOL COMPANY: Electric Mounted Coal Drills Permissible and Open Type; Electric Unmounted hand-held Coal Drills Permissible and Open Type; Pneumatic (Air) Unmounted hand-held coal drills; Pneumatic (Air) Singer rock drills and auger drills of the percussive type; Electric and Pneumatic (Air) portable drills, woodborers, screwdrivers, nut runners, and grinders for mine car repair and maintenance purposes; Pneumatic (Air) Riveting and Chipping Hammers; Electric Hammer Drills for drilling trolley-hanger holes.

● THE COLUMBIA ALKALI CORPORATION: Will exhibit a revolutionary new product, Col-Rec which improves the burning qualities and renders coal dustless.

● THE DEISTER CONCENTRATOR COMPANY: Will display commercial size 4'x7' Leahy Heavy Duty Vibrating Screen, motor drive (and under power) equipped for dedusting and fine screening; and exhibit stand showing Concenco Spray Nozzles; and moving photographic display of Deister-Overstrom Diagonal-Deck Coal Washing Table installations.

● THE DUFF-NORTON MANUFACTURING CO.: Will exhibit a simplified positive mechanism in Automatic Lower Jacks.

● DUNCAN FOUNDRY & MACHINE WORKS, INC.: Will exhibit both "cast steel" and chilled gray iron "wheels," miscellaneous castings, and one "cast steel mine car bottom."

● THE ELECTRIC RAILWAY EQUIPMENT CO.: A new line of special mining type Quick Break Switches with Channel Iron Bases. These switches are now offered in a complete range of size from 200 to 1,500-ampere capacity. A complete line of new section insulators, dual trolley and feeder clamp splicers are being offered the operators, utilizing 1,000,000 and larger size feeder cables and special 6/0 and 350,000 CM Trolley Wires, both of which can be supported from one insulated trolley hanger.

(*Continued on page* 69)

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THE VALUE OF COOPERATION

There is probably no word in the English language which has had more facetious definitions and which is more often mis-applied than cooperation. The dictionary defines this word as "The act of working jointly together."

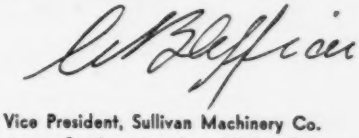
Years ago when the coal mining industry was in its infancy, the manufacturing of equipment for coal mining purposes was also just starting. The mines at that time were of small tonnage capacity and a comparatively few number of miners were employed in each pit. Manufacturing concerns were also small in size and had a correspondingly few number of employes. This difference in size made for better understanding and cooperation between the individual mines and the individual manufacturers. Cooperation was easier to obtain. Because of this cooperation inventive strides were made which brought about the development of machinery adapted for mining conditions which enabled us to become a country of outstanding leadership not only in the art of coal mining but also in the manufacture and production of coal mining equipment.

The various advantages brought about through this close contact has also brought about other complications and problems due to the increase in size not only of the mines but also of the manufacturing companies. Today the management of a coal mine has many other problems than equipment to lower operating costs. Such problems are: more complicated labor relationships, interstate railroad rates, taxation problems, unemployment insurance, old age pension plans, the Guffey Bill, more complicated marketing, sizing and selling problems, and many others. The management of manufacturing corporations, due to their increase in size, have many diverse problems to consider along similar veins.

We all recognize that there still is the need of cooperation between manufacturers and coal mining interests. We also must expect a certain amount of struggle between capital and capital, between industry and industry, and between company and company. We undoubtedly will continue to have these struggles; which will keep us occupied, a certain amount worried, and also give us a certain amount of pleasure. We will not become so thoroughly regimented as to eliminate the needs of mutual assistance or the advantages and fun of competition. We have great need of cooperation as a coal mining industry, not only with all mining interests, but also with all allied interests, to preserve the place of coal against the competition of other fuels such as gas, oil, and hydro-electric developments.

We need cooperation between manufacturing concerns and the mining companies. It is the individual problem of each manufacturing concern to endeavor to get better cooperation with the mining companies.

The American Mining Congress serves to bring about this cooperation not only for the benefit of the industry as a whole, but also between competing manufacturing concerns and competing coal companies as a meeting ground and a common place for exchanging of viewpoints.



Vice President, Sullivan Machinery Co.
Chairman, Manufacturers Section, American Mining Congress

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PROG

THE AMERICAN MINING CONGRESS

PRACTICAL COAL

Music Hall, Cincinnati,

Monday, May 11

10.00 A. M.

CHAIRMAN: I. N. BAYLESS, *Asst. Gen. Mgr., Union Pacific Coal Co.*

INTRODUCING

E. J. NEWBAKER, *Vice President, The Berwind-White Coal Mining Co., Chairman, Coal Division*

R. E. SALVATI, *Gen. Mgr., Island Creek Coal Co., National Chairman, Program Committee*

C. B. OFFICER, *V. P., Sullivan Machinery Co., Chairman, Manufacturers' Section, Coal Division*

COAL PRODUCTION METHODS—TODAY AND TOMORROW

PAUL WEIR, *Vice Pres., Bell & Zoller Coal & Mng. Co.*

PROGRESS OF MECHANICAL LOADING AND CONVEYOR MINING IN ALL FIELDS OF THE UNITED STATES, INCLUDING MINING CONDITIONS AND FACTORS AFFECTING DEVELOPMENT

(Each paper will be a review only of new things within the district covered)

T. F. MCCARTHY, *General Superintendent, Clearfield Bituminous Coal Corporation.*

JOHN H. RICHARDS, *Mng. Engr., Hanna Coal Co. of Ohio.*

THOMAS MURPHY, *Superintendent of Mines, Northwestern Improvement Co.*

C. F. HAMILTON, *Vice Pres., Binkley Coal Co.*

H. B. HUSBAND, *Gen. Mgr., Fuel Mines, Chesapeake & Ohio Rwy. Co.*

JAMES WHITE, *Supt., Mine No. 48, Peabody Coal Co.*

COAL CLEANING PLANT, NORTHWESTERN IMPROVEMENT CO.

E. R. MCMILLAN, *Mining Engineer, Northwestern Improvement Co.*

2.30 P. M.

CHAIRMAN: J. D. ROGERS, *Vice President, Stonega Coke & Coal Co.*

MODERN PRODUCTION METHODS AND THE FUTURE OF COAL

EUGENE MCAULIFFE, *President, Union Pacific Coal Co.*

NEW THINGS IN MINE SAFETY (5-minute presentations)

Locomotives Painted With Aluminum and Having Reflex Mirrors

J. V. BERRY, *Supervisor of Safety, Compensation and Relief, Industrial Collieries Corp.*

Broadcasting Safety Messages Underground

JOHN LYONS, *Safety Engineer, Bell & Zoller Coal & Mining Co.*

Bonus Payments

EUGENE MCAULIFFE, *President, Union Pacific Coal Co.*

ERNEST TODD, *Chief Clerk, Bell & Zoller Coal & Mining Co.*

HITCH DRILL PRACTICE

FRANK M. SCHULL, *Gen. Supt., Binkley Mng. Co.*

PORTABLE MINE CAR COMPRESSOR

F. C. CAROTHERS, *Gen. Supt., Pond Creek Pocahontas Co.*

EFFECT OF WIDE PLACES ON ROOF

O. B. PRYOR, *Gen. Supt., Elm Grove Mng. Co.*
ALEXANDER JACK, *Pennsylvania Coal & Coke Co.*

Tuesday, May 12

10.00 A. M.

CHAIRMAN: HARRY M. MOSES, *Gen. Supt., United States Coal & Coke Co.*

OUR MODERN COAL INDUSTRY

C. F. HAMILTON, *Vice Pres., Binkley Coal Co.*

NEW THINGS IN COAL CLEANING (5-minute presentations)

A. E. ROBERTS, *Chief Engineer, Heisley Coal Co.*

W. J. SKEWES, *Mechanical Engineer, Pocahontas Fuel Co., Inc.*

R. H. SHERWOOD, *Pres., Central Indiana Coal Co., Inc.*

PALMER C. SARICKS, *Vice Pres., Wolf Collieries Co., Inc.*

E. J. WEIMER, *Gen. Mgr., Snow Hill Coal Corp.*

J. B. MORROW, *Prep. Mgr., Pittsburgh Coal Co.*

T. C. MULLINS, *Pres., Northern Illinois Coal Corp.*

W. E. WOLFE, *Elec. & Mech. Supervisor, Clinchfield Coal Corp.*

TRIP DISPATCHING AND CAR MOVEMENT RECORDS

R. G. LAZZELL, *Operating Supt., Island Creek Coal Co.*

Discussion:

WM. J. WOLF, *Division Manager, Consolidation Coal Co.*

POWER PLANT OPERATION

R. H. SHERWOOD, *Pres., Central Indiana Coal Co., Inc., and Pres., Antioch Power Co.*

ROCK TUNNELING WITH SHAKING CONVEYORS

M. A. SHARP, *Foreman, Union Pacific Coal Co.*

TREATMENT OF TUNNEL DRIVING, ANTHRACITE FIELD

B. L. LUBELSKY, *Explosives Engr. and Tunnel Supt., Philadelphia & Reading Coal & Iron Co.*

2.30 P. M.

CHAIRMAN: H. C. FAUST, *General Manager, United Pocahontas Coal Co.*

CUTTING BIT TREATMENT (5-minute presentations)

N. A. ELMSLIE, *Div. Supt., Industrial Collieries Corp.*

E. H. JENKS, *Mng. Engr., Rochester & Pittsburgh Coal Co.*

H. E. SCHWEINSBERG, *Prod. Engr., The Valley Camp Coal Co.*

JAMES HYSLOP, *Chf. Engr., Walter Bledsoe & Co.*

D. D. WILCOX, *Gen. Supt., Superior Coal Co.*

POWER EFFICIENCIES

C. H. MATTHEWS, *Elec. Engr., Susquehanna Collieries Co.*

THE ECONOMICS OF AC-DC CONVERSION

W. A. BUCHANAN, *District Manager, Appalachian Electric Power Co.*

RAM

THIRTEENTH ANNUAL CONVENTION

OPERATING MEN

Ohio, May 11-15, 1936

COAL BUMPS UNDER HEAVY COVER
JOHN F. DANIEL, *Chief, Department of Mines and Minerals of Kentucky*

AERO MECHANICS AS APPLIED TO MINE VENTILATION AND FANS
A. LEE BARRETT, *Pittsburgh Coal Co.*

Wednesday, May 13

10.00 A. M.

CHAIRMAN: H. L. GRIFFIN, *Division Engineer, Koppers Coal Co.*

PROGRESS IN RELATED FIELDS OF INDUSTRY
L. E. YOUNG, *Vice Pres., Pittsburgh Coal Co.*

ACCIDENT RECORDS: COMPARISON AND CAUSES OF ACCIDENTS OVER FIVE-YEAR PERIOD
W. W. ADAMS, *Supervising Statistician, Employment Statistics Section, United States Bureau of Mines*

Discussion: (5-minute presentations)
N. P. RHINEHART, *Chief, Department of Mines of West Virginia*
JAMES MCSHERRY, *Director, Department of Mines and Minerals of Illinois*
M. J. GROGAN, *Assistant Manager, Lynch Coal Operators Reciprocal Association*
WM. RICHARDS, *Safety Engr., Madeira, Hill & Co.*
W. J. STITELER, JR., *Vice Pres., Coal Operators Casualty Co.*
THOS. P. KEARNS, *Supt., Div. of Safety & Hygiene, Industrial Commission of Ohio*
J. F. BRYSON, *Safety Dir., Harlan County Coal Oprs. Assn.*

ROCK DUSTING
P. H. BURNELL, *Supt., Owl Creek Coal Co.*

INCREASING EFFICIENCY IN TRANSPORTATION
JOSEPH ANSTEAD, *Electrical Engineer, Templeton Coal Co.*

Discussion:
LEE HASKINS, *Supt., Zeigler No. 1 Mine, Bell & Zoller Coal & Mng. Co.*

EMPLOYES SAFETY MEETINGS—OPEN AND CLOSED
CHAS. W. CONNOR, *Superintendent of Mines, Nellis Coal Corp.*
J. B. BENSON, *Koppers Coal Co.*
G. A. ROOS, *Assistant General Manager, Philadelphia & Reading Coal & Iron Co.*

2.30 P. M.

CHAIRMAN: W. L. AFFELDER, *Vice Pres., Hillman Coal & Coke Co.*

CUTTING OUT IMPURITIES IN COAL SEAM
W. D. NORTHOVER, *Preparation Engineer, Rochester & Pittsburgh Coal Co.*

PROSPECTING FOR COAL WITH DIAMOND DRILLS
C. E. SWANN, *Chief Engineer, Union Pacific Coal Co.*

COAL CLEANING AT THE PEABODY COAL COMPANY
JACK R. VERHOEFF, *Peabody Coal Co.*

RELATION BETWEEN LIFE OF ENTRY AND TYPE OF TRACK EQUIPMENT
GEO. E. BAYLES, *Chf. Engr., Ohio & Pennsylvania Coal Co.*
PAUL HALBERSLEBEN, *Gen. Supt., Sahara Coal Co.*

GENERAL USE OF POWER AND ENERGY AT THE MINE
C. C. KNIPMEYER, *Cons. Engr., and Head, Electrical Engineering Department, Rose Polytechnic Institute*

WELDING AS A MONEY SAVER
E. S. WADE, *Superintendent, Windsor Power House Coal Co.*

Thursday, May 14

10.00 A. M.

CHAIRMAN: PETER F. LOFTUS, *Consulting Engineer*

MODERN MINING METHODS AND COAL'S FUTURE
P. C. THOMAS, *Vice Pres., Koppers Coal Co.*

HIGH PRODUCTION IN CUTTING MACHINE EFFICIENCIES
DAVID INGLE, JR., *Supt., Buckskin Coal Corp.*
THOS. L. GARWOOD, *Engr., New Orient Mine, Chicago, Wilmington & Franklin Coal Co.*

CONVEYOR MINING
H. E. WILLSON, *Chf. Engr., Laurel Creek Coal Co.*
THOS. F. STEELE, *Gen. Manager, Penn Anthracite Collieries Co.*
E. A. SIEMON, *Div. Gen. Supt., Hillman Coal & Coke Co.*

NEW DESIGNS IN CAR CONSTRUCTION
Development of Mine Cars over Eight-Year Period at Koppers Coal Co.
F. S. FOLLANSBEE, *Chief Engineer, Koppers Coal Co.*
Reducing Costs with Modern Pit Cars
C. J. SANDOE, *Vice Pres., Perry Coal Co.*
R. E. HOBART, *Mech. Engr., Lehigh Navigation Coal Co.*
Essentials in Mine Car Design
A. R. LONG, *Supt., New River Co.*

MODERN PRODUCTION METHODS AT BELL & ZOLLER COAL AND MINING CO.—(A talking motion picture)

2.30 P. M.

CHAIRMAN: K. A. SPENCER, *Vice President, Pittsburg & Midway Coal Mining Co.*

IMPORTANCE OF EFFICIENT PRODUCTION METHODS
R. E. TAGGART, *President, Philadelphia & Reading Coal & Iron Co.*

MECHANICAL LOADING SYSTEM
T. J. THOMAS, *Pres., Valier Coal Co.*

AIR CONDITIONING
H. G. CONRAD, *Gen. Supt., Knox Consolidated Coal Corp.*

HAULAGE PRACTICE
H. W. SAUNDERS, *Chief Engineer, American Coal Co. of Allegany County*
WALTER BUSS, *Mining Engineer, Knox Consolidated Coal Corp.*

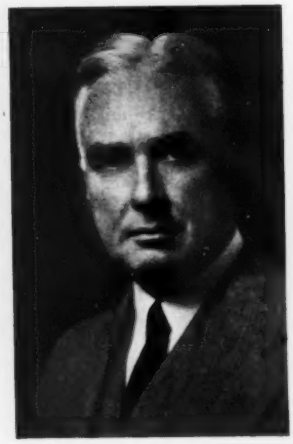
TRACKLESS MINING
O. S. BATTEN, *Mng. Engr., Utilities Elkhorn Coal Co.*

WELDED RAIL JOINTS FOR MINE TRACKS
G. STUART JENKINS, *Gen. Supt., Consolidated Coal Co.*

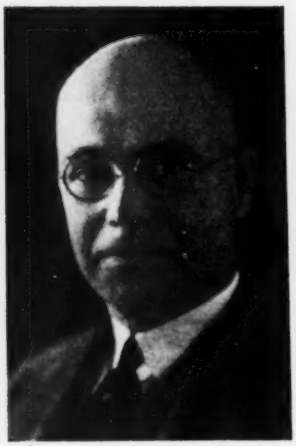
Discussion:
IRVIN C. SPOTTI, *Mine Foreman, Hanna Coal Co. of Ohio.*

Members of the

C. F. Hamilton



F. S. McConnell

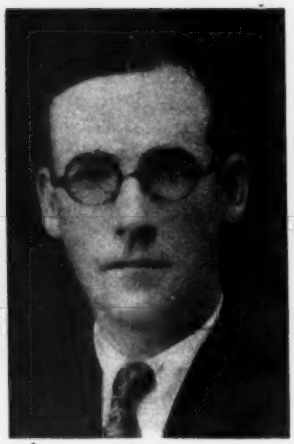


W. P. Cayton

R. J. Ireland, Jr.

Geo. Dunglinson, Jr.

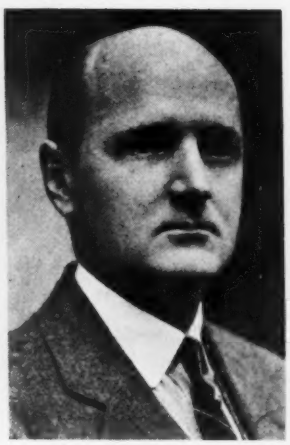
H. B. Husband



P. C. Graney

T. R. Johns

C. J. Sandoe



W. H. Lesser

James Hyslop

George C. McFadden

Program Committee

W. J. Borries

Paul Weir

Dr. L. E. Young

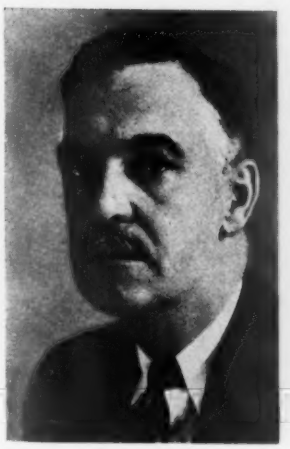
John C. Cosgrove

R. A. Templeton

J. J. Sellers

R. H. Sherwood

H. S. Gay



R. V. Clay

F. S. Pfahler

Geo. B. Pryde

R. H. Morris

T. W. Guy

M. D. Cooper

K. A. Spencer

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REASONS WHY COAL MEN SHOULD ATTEND THIS MEETING . . .

Because . . .

. . . Many problems of special interest to every coal producer will be discussed at the convention.

. . . Every type of mining machine and mine supply will be presented on the floor of the exposition.

. . . You will have an opportunity to contact operators from every coal producing district, and to learn things of interest from their experience in producing coal safely and efficiently.

. . . You will be able to compare types of equipment, which would require days of travel and inconvenience, if an attempt were made to get this information in any other manner.

. . . Every progressive coal company and coalman that can possibly do so will be present.

. . . You are offered a major course in Modern Mining plus an actual visualization as to how this modern mining may be successfully applied to your production problems.

. . . Men and Machines are the answer to many of coal's problems. THIS MEETING offers the maximum of return to every individual participating.

W. C. Shunk

T. C. Mullins

\+ + +

Peter F. Loftus

H. A. Treadwell

B. H. Schull

C. T. Hayden

● THE ELECTRIC RAILWAY IMPROVEMENT CO.: Will display their rail bonds and arc welding rheostats. Two new designs of bonds for steel electrode welding are shown for the first time. These are an improved crass bond and an improved short under rail bond.

● THE ELECTRIC STORAGE BATTERY COMPANY: Will include those types of Exide and Exide-Ironclad Batteries that are used for haulage and for control bus, signal, telephone and emergency lighting service. Cutaway cells will be exhibited to show why an Exide-Ironclad Battery of the TLA type, for example, has 42 percent greater capacity than an MVA type, occupying the same amount of floor space. There will also be shown cutaway cells of the larger types of Exide-Ironclad haulage batteries, such as the FLM type.

S. Cottingham

E. R. Price

● ENTERPRISE WHEEL & CAR CORP.: Two types of full sized cars will be shown. A thin seam car, 54 cubic feet level capacity, with unique features for use on inclines and with rope haulage and an especially developed stub axle car, 203 cu. ft. level capacity, for conveyor loading. This construction will demonstrate how an already efficient design can be made more effective and longer lived by utilizing alloy steels with their higher tensile strength, light weight and rust resisting qualities.

● THE FAFNIR BEARING COMPANY: Will exhibit conventional ball bearings together with bearings of a specialized nature which are particularly adaptable to the mining industry, a particularly fine example of the Sanford-Day Fafnir Ball Bearing equipment.

Newell G. Alford

Chas. W. Connor

● GENERAL ELECTRIC COMPANY: The principal feature of the exhibit will be a six-ton low height trolley mining locomotive. A display of the various types of cable used for mining applications will be made, and a 1,000-watt G-E floodlight will also be shown. The silent-operating mercury switch will be exhibited in comparison with a standard type of household switch. No larger than a coat button, the mercury switch has no moving parts and can be adapted to any switching operation. Popular interest in the exhibit will be solicited with various other displays, including "steel that floats"—a bar magnet suspended in air; a demonstration of a photo-electric device which automatically clears a tunnel of smoke and fumes when an "electric eye" detects the thickened atmosphere and starts blowers, and alnico, the newly developed magnetic alloy which has the ability to lift 60 times its own weight.

● GOODMAN MANUFACTURING CO.: Will exhibit a shaker conveyor display consisting of two units—A and B. Unit A will show a reversible drive transporting coal on the level from the face, and timbers and troughs to the face, thus demonstrating the reversibility

M. L. Garvey

P. C. Thomas

W. L. Robison

D. A. Reed

of the unit. Unit B will demonstrate the transporting of coal up a severe grade.

In unit A will be included latest design of Duckbill Type LOB, which has a positive feed forward and back, and a hinged arrangement allowing it to follow the bottom. This unit will also include a swivel trough, an angle trough, silent trough supports, and various types of trough connectors. The drive, which is Type HR, will be equipped with a Goodman fly wheel type motor.

In unit B will be included a special drive with an F motion, equipped with a Goodman fly wheel type motor, showing the possibility of transporting coal up a severe grade. The new Goodman Type 260-A Track Loader composed of five units, any of which can be removed from the chassis upon which they are mounted without disturbing another unit will be shown, also Mancha literature and photographs. St. Louis Power Shovel Company literature and photographs of the Conway Loader will be on display.

● GULF REFINING CO.: A display of Gulf's industrial lubricants, and demonstrations of Gulf's mine car grease will be accomplished by a number of sectioned mine car wheels showing different methods of greasing, of grease storage within the wheel of sealing the grease in the hub, as well as interesting developments in mine car wheel design and casting. There will be a demonstration of lubrication of a new type variable speed motor driven gear reduction unit.

● HENDRICK MANUFACTURING CO.:Will show a complete line of Perforated Screen Plates with samples in all shapes of openings, featuring Flanged Lip Screens. Also Testing Screens, Milled Slot Screens and "Mitco" Open Steel Flooring and "Mitco" Shur-Site Treads.

● HERCULES POWDER COMPANY: Will emphasize the various explosives and blasting supplies used in the coal-mining industry. Of particular importance will be a display of Hercotube, a new, individually packed package for electric blasting caps which has certain advantages of safety and convenience. Another highlight of the display will be the Hercules "No Vent" All Metal Delay Electric Blasting Cap, with its patented gasless delay element that requires no vent in the shell. The explosives exhibit will include the Hercules line of permissibles, black blasting powder, and Pellets A, B, C, and D.

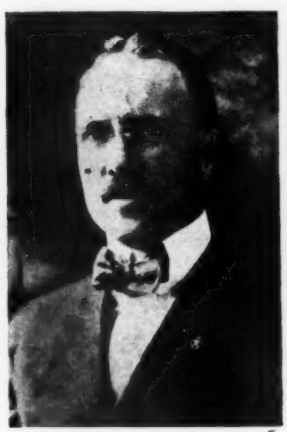
● HULBURT OIL & GREASE CO.: Will display a complete line of Hulburt quality grease.

● THE JEFFREY MANUFACTURING CO.: Will exhibit L-400 Loader; a new type frontal attack loader with a high capacity. The sectional 52*B entry conveyor will show self-aligning features. The 41-A Coal Cutter is a new type conveyor shortwall machine for top cutting. The Super-Aerovan Fan is new, having higher efficiencies than anything offered before in this type fan.

Complete equipment to be exhibited by this company includes: L-400 Loading Machine, A-6 Post Drill, A-7 Hand Drill, 61-AM Room Conveyor with 61-EA Elevating Conveyor, 61-HG Face Conveyor, Section of 52-B Entry (Belt) Conveyor, 41-A Coal Cutter, Type 61 Blower, Aerovane Fan, Super-Aerovane Fan, Traylor Vibrating Feeders, Parts of Coal Washing Jib, Single Roll Crusher, Double Roll Crusher, Group of Renewal Parts for Cutters and Locomotives.

● THE JOYCE-CRIDLAND CO.: Will show mining machine jacks of the automatic lowering type. Design features in connection with this particular jack include a strengthening of the frame to permit of heavier loading on a lighter weight jack; centralizing and balancing of carrying handles to lighten the labor of moving jack from one location to another, especially in low ceiling veins.

R. T. Todhunter



F. W. Whiteside

Board of Governors, Coal Division

L. N. Thomas

Thos. G. Fear

A. J. Musser

R. E. Taggart

Otto Herres

E. J. Newbaker
Chairman

R. L. Ireland, Jr.

S. B. Johnson

T. D. Lewis

G. P. Bartholomew

T. M. Dodson

Julian D. Conover
Secretary, The American Mining Congress

● JOY MANUFACTURING COMPANY: Will display three loading machines and two conveyors as follows: One Type 11 BU Joy Loader, constructed to an overall height of 54" loading rate of 4 tons per minute for heavy duty production in thick seam operations. One Type 8 BU Joy Loader, constructed to an overall height of 35", a loading rate of 1½ tons per minute for mine pit car or concentrated conveyor transportation systems in medium height working conditions. One Type Joy Junior Loader, constructed to an overall height of 26", loading rate of ½ ton per minute into pit cars or concentrated conveyor systems, in working places having a minimum thickness of 32". One Joy Chain Conveyor Unit for face and room production in concentrated systems of Joy Loaders and continuous transportation behind the machines. One Joy-M & C Trough Belt Conveyor Drive, Pan and Takeup Section, designed for transporting aggregate tonnage from multiple shaker or chain conveyor units for extensions to a total of 1,800' and in width and drive speeds allowing selections from 75 to 325 tons per hour.

● KANAWHA MANUFACTURING CO.: Continuous reel showing side hill slate or refuse dump, Meehanite Metal exhibit, miscellaneous mine car wheels, and working model of chloride wash box.

● KEYSTONE LUBRICATION CO.: Will display a complete line of lubricating greases and lubricating devices, especially adapted to lubrication of mining machinery.

● KOPPERS-RHEOLAVEUR CO.: Will show a mechanical and electrical display of some Rheolaveur plant installations and interior views of plants. Mechanical corner piece, electrically operated, featuring Menzies Cone Separator, Carpenter Drier, and other equipment.

● THE LABOUR COMPANY, INC.: Will exhibit a LaBour self priming centrifugal pump which will illustrate its behavior under mine water gathering service. In addition there will be several other pumps of different types and materials of construction for handling corrosive mine waters. There will be suitable cutaway sections to give the observer an understanding of the design and quality of material used in the pump construction.

● LA-DEL CONVEYOR & MANUFACTURING CO.: Will exhibit three pieces of underground conveyor equipment, namely a shaker conveyor which will be equipped with a radically and entirely new design of carriage and guide frame that will be shown for the first time at the Mining Congress, also an underground belt conveyor with a very unique method of adjustable discharge. A chain and flight type conveyor incorporating several unique methods of avoiding breakage, crushing, or jamming of coal at the discharge drive will be displayed.

● LEHIGH SAFETY SHOE CO., INC.: Will display a complete line of all leather safety shoes made with improved steel box toes for industry also a complete line of rubber footwear, such as, miner's pacs and boots, constructed with hard rubber composition box and genuine leather insole.

● A. LESCHEN & SONS ROPE CO.: This exhibit includes various types of standard Round Strand constructions, Flattened Strand constructions and wire ropes of the Preformed type in both Round Strand and Flattened Strand types.

● LINK-BELT COMPANY: Will present an entirely new portable backed wall containing a beautiful central display panel 10 ft. wide, in which is placed a Scene-in-Action Unit of the Link-Belt Rotary Louvre Dryer. It presents a self-explained picture, with motion, showing the material being discharged into the drum; the hot air being blown into the drum underneath the bed of material; the hot air passing through the bed of material and then drawn out into a Cyclone Dust Arrester. Flanking this unit on both sides are four panels, each containing an illuminated colored photo enlargement of the various steps in the handling and preparation of coal at the mine. An operating model of the electric eye principle used in the automatic and continuous discharge of rejects from the Link-Belt Simon-Carves washery will be on display. A miniature model of a Link-Belt Simon-Carves washery, encased in a glass case, will be prominently displayed. A 1936 Link-Belt Automatic Coal Burner will be exhibited with sufficient literature on the complete line of domestic and industrial stokers.

Samples of the new line of Link-Belt Anti-Friction Pillow Blocks and Streamlined Plain Pillow Blocks and Take-ups will be shown, together with samples of the most commonly used sizes of Link-Belt Chains for conveying and power transmission. In addition, there will be operating units of the Link-Belt P. I. V. Gear, variable speed transmission with a remote control arrangement; also, Link-Belt Motorized Speed Reducer.

● MACWHYTE COMPANY: Is exhibiting a new type of sling, which is used for handling material of all kinds. The big feature of this sling is that both thimbles are the same size and yet they telescope. A revolving reel, revolved by an endless wire rope made by a piece of wire rope seven times the circumferential length of the belt made from the wire rope, will be on display.

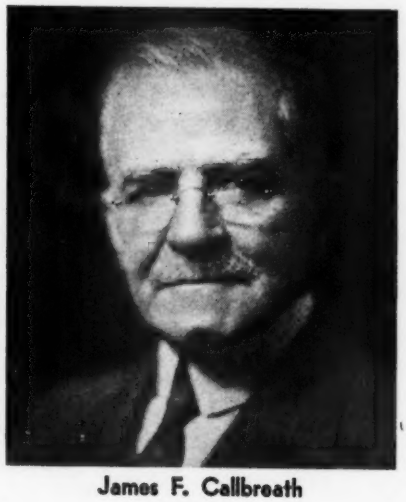
● THE McNALLY PITTSBURG MFG. CORP.: Will show small pieces of special equipment and large photographs and drawings of plants which they built and have under construction.

● MINE SAFETY APPLIANCES CO.: The following material will be exhibited: New M.S.A. Methane Detector, New M.S.A. Air Velocity Indicator, Edison Model K Electric Cap Lamps, M.S.A. Comfo Caps and Skullgards, M.S.A. Comfo Dust Respirators, First Aid and Mine Rescue Equipment.

● MORRIS MACHINE WORKS: Will display medium duty sand pumps, which is the type of pump generally used in the coal cleaning operations of the various manufacturers. Also an all-bronze double suction mine water pump for dewatering mines. This pump will incorporate all the latest advances in construction of pumps of this type, including new type sealing ring which has been in operation in several of the coal mines for about a year. A small model sand pump, pumping from glass tanks and through glass pipe line will be shown.

● THE MORROW MANUFACTURING CO.: Will present a five-track, five-grade tipple with shaking screens, pick-

(*Continued on page* 74)



James F. Callbreath
Secretary-Emeritus

Convention Speakers

C. C. Knipmeyer

P. C. Saricks

O. S. Batten

D. D. Wilcox

N. A. Elmslie

Chas. E. Swann

Geo. E. Bayles

Jack R. Verhoeff

A. R. Long

W. A. Buchanan

E. J. Weimer

A. E. Roberts

W. L. Affelder

J. V. Berry

P. H. Burnell

ing tables, etc. The screens are built in two units, one unit handling the larger sizes of coal and running at about 100 strokes per minute, while the other unit handles the smaller sizes of coal at a speed of approximately 160 strokes per minute.

● MYERS-WHALEY COMPANY: Will exhibit a No. 3 Size "Whaley Automat" Coal Loading Machine in operation. This is 44 inches high, with maximum capacity of seven tons per minute, average capacity of three tons per minute and power consumption of less than ¼ K.W.H. per ton of material handled, is the latest product of a factory devoted exclusively to the manufacture of loading machines for 28 years.

● NATIONAL CARBON COMPANY: Will show a full line of carbon, graphite and metal-graphite brushes. There is an opportunity to learn of the new developments in brushes and their applications to motors, generators, and converters. Other products such as welding carbons, electrodes, rods and plates, permissible flashlights, shot firing units, and batteries will be on display. Various Haynes Stellite Products such as coal cutting bits and shovels will be exhibited. Interesting items of oxy-acetylene welding apparatus as well as examples of maintenance uses of the oxy-acetylene process will be demonstrated. Carbic Flood Lamps, Linde and Prest-O-Lite appliances and other interesting products will complete the exhibit.

● NATIONAL ELECTRIC COAL CO.: Will show a general display of coal mine motor coils, and a unit of a coal tipple magnet of a brand new design.

● NATIONAL MALLEABLE AND STEEL CASTINGS CO.: Will present the Naco Steel Mine Car Wheels, Swivel Hitchings, Willison Mine Car Couplers, Plain Link Hitchings, Naco Steel Steam Shovel and Drag Line Chain with Joining and Repair Links.

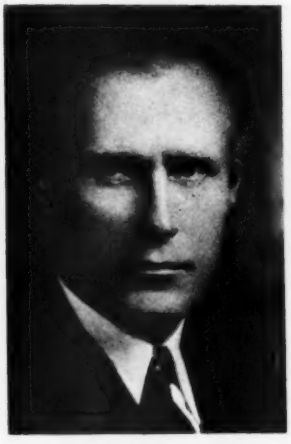
● THE NEW DEPARTURE MANUFACTURING CO.: Will exhibit ball bearings for mine car wheels, also other lines of regular and seal bearings, and the Transitory, variable speed transmission.

● NORDBERG MANUFACTURING CO.: Will display a 3 x 8′ Double Deck Symons Screen and a small working model to show the action of the Symons Screen.

● NORMA HOFFMAN BEARINGS CORP.: Will display a complete range of samples of various types of ball, roller and thrust bearings and various styles of pillow blocks and mountings. Also a model of a mine locomotive motor illustrating the mounting of precision roller bearings at the pinion end and showing how the end float of the armature can be accommodated by the roller bearing without movement of the bearing in the motor frame.

(*Continued on page* 76)

W. D. Northover



Paul Halbersleben

I. N. Bayless

David Ingle, Jr.

R. G. Lazzell

Lee Haskins

Thos. Murphy

H. M. Moses

E. R. McMillan

H. E. Willson

H. L. Griffen

E. S. Wade

John Lyons

T. F. McCarthy

R. E. Hobart

John F. Daniel

F. F. Jorgensen

T. F. Steele

● OHIO BRASS CO.: Exhibiting overhead trolley line materials, rail bonds and welders, automatic motor starters, porcelain insulators, feeder wire supports, current collectors.

● PENN MACHINE COMPANY: Exhibit will include "Replacement Parts for Mining Machines, and Mine Locomotives, including Gears, Pinions, Bronze Bearings, and 'Super-Weld' Rail Bonds." Three new types of "Super-Weld" rail bonds, and several new replacement parts also will be shown.

● PORTABLE LAMP & EQUIPMENT CO.: Will display Portable mine car stop, Portable's mine car skid, Portable's Mine Car Derailer, Combination splint-stretcher board, Heated First Aid Cabinet.

● PURE CARBON COMPANY, INC.: Will display boards showing the different sizes and types of carbon brushes. A story in pictures will be shown by automatic balopticon illustrating the story of carbon brushes.

● PURE OIL COMPANY: Will present certain lubricants applicable to the mining industry under near zero conditions for the purpose of illustrating their fluidity and low pour point. Along with this a general line of recommended mining lubricants and mining literature will be displayed.

● REPUBLIC STEEL CORPORATION: Will display samples of a group of products recommended for use in the coal mining industry. An unusually attractive background of stainless steel will include a moving display portraying one of the spectacular operations in Republic mills. Samples of Toncan Iron Pipe and Sheets, of Republic Double Strength Steels as used in the manufacturing of mine cars, of bolts and nuts, of Enduro Stainless Steel, and of other Republic products will be on display.

● ROBINS CONVEYING BELT CO.: Will exhibit a set of sample belt conveyor idlers, which will include standard Timken roller bearing troughing idlers with one pulley and partially cut away to show the assembly of roller bearings and grease seals and automatic bearing adjustment. Automatic training idlers for both the troughed and the flat return strands of any belt conveyor. Wearproof, rubber-covered idler, designed especially for resistance to abrasion, and used extensively in conveyors handling coke, wet sand and other abrasive materials.

Also a set of enlarged photographs of Robins GYREX screens and of other Robins products and plants of Robins' design; samples of Super-Gyraloy screen cloth; a sample of the heaviest conveyor belt ever built and a supply of bulletins and other printed matter descriptive of this company's complete line of manufacture will be displayed.

● SAFETY FIRST SUPPLY COMPANY: Will present protective clothing, miners shin guards, goggles, respirators, helmets, first aid dressings and kits, gas masks, trip lamps, miners safety caps, miners safety shoes.

● SAFETY MINING COMPANY: Will display an enlargement of their Cardox Giant trade-mark carved out of wood, flasher bulbs give the illusion of the giant pushing down the coal illustrating the slow heaving action of Cardox for breaking down coal. Two giant wooden Cardox cartridges with green lighted revolving caps acting as beacons. Also there will be a cross-sectioned chromium plated Model B-2-80 cartridge and a cross-sectioned chromium plated Model 3-200 low pressure Cardox cartridge. These two cartridges will probably rest on a table near the front of the booth.

● SIMPLEX WIRE & CABLE COMPANY: Will exhibit Tirex portable cables and cords for cutting machines, locomotives and loaders; armored borehole and shaft cables; distribution cable; Tirex shot fire cord.

● S K F INDUSTRIES, INC.: Will demonstrate the application of S K F Bearings on the shaft of a mine locomotive motor and on the journal of a mine locomotive wheel. A complete line of S K F Ball and Roller Bearings will also be shown.

● SOCONY-VACUUM OIL CO., INC.: Will present achievements of Socony-Vacuum products—70 years of experience behind them—which will give a new appreciation of lubricants branded with the Red Gargoyle or the Flying Red Horse.

● STANDARD OIL COMPANY: Will feature full line of lubricants and coal spray oils.

● STEPHENS-ADAMSON MFG. CO.: Will exhibit new Air-Sand Coal Cleaner, with an operating model to show how the coal is freed from impurities from the float-sink action in a dry liquid, created by bubbling air through sand. The specific gravity of this liquid can be varied by regulating the volume of air to obtain proper separation on different coals. Also several models of the Redler Conveyor-Elevator in which coal can be conveyed horizontally, vertically or around curves in one enclosed unit, the coal being conveyed in a solid, dustless column with practically no breakage.

● SULLIVAN MACHINERY CO.: Will show three new coal cutters; together with a modern line of mine type compressors, drills and hoists. Cutter bit sharpening and hard-facing plant will also be presented.

● SUN OIL COMPANY: Will display a complete line of mine lubricants. Coalkote for dustless treatment of hard fuel. Featuring the new Coalkote "CBO"—of unusual permanence and value.

● TEMPLETON, KENLY & CO.: Will show a complete line of Simplex jacks specially designed for mine service.

E. J. Christy

F. S. Follansbee

W. W. Adams

H. E. Scheweinsberg

A. Lee Barrett

Ernest Todd

B. L. Lubelsky

● TIMKEN ROLLER BEARING CO.: Will feature cutaway wheels showing clearly how the different types of wheels are mounted on mine car axles, with a larger display showing how railroad wheels on the new high speed trains are mounted. Special display will be given to closures, one axle showing the standard two bearing mounting with the annular groove closure and the other end featuring the latest Timken labyrinth closure as used with the standard Timken Bearing mounting. Another axle will show the conventional mounting and demonstrate how the new Timken combination nut and closure is applied, giving the protection of annual groove closures to the outer end of the journal in addition to functioning as an adjusting nut for the two Timken Bearings which constitute the wheel mounting. Several types of the most recent quick demountable wheels held in place by U-bolts and fitted with the Timken

Frank C. Carothers

double cup bearings will be exhibited. These designs include the new Timken shrunk-on dust collar modified to provide a labyrinth seal.

In addition to the full size wheel and axle displays, the company will exhibit bearings of various sizes and types and will have on hand copies of the new Timken Mine Car and Mine Locomotive section of their *Engineering Journal*, a 64 page book showing all types and combinations of mine car mountings, closures, etc., with ample details to give the designer, builder, or user full information.

● THE TOOL STEEL GEAR AND PINION CO.: Will display "Tool Steel" hardened gears, pinions and similar parts as used in the coal mining industry.

● THE W. S. TYLER CO.: Will present a two surface Type 300 Tyler-Niagara screen and a 4' x 8' single surface Type 400 Electric Screen. Also samples of various weaves of woven wire screen cloth.

● TYSON ROLLER BEARING CORP.: Will exhibit Tyson Cageless Tapered Roller Bearings for mine car applications and several Mine Car Seals. Combined Nut Seal which eliminates some parts and permits a small saving per car set. The Combined Nut Seal is new.

● UNITED STATES STEEL CORP. SUBSIDIARIES: Will show a new type mine car made with Cor-Ten Steel, with an exposition of the saving in weight possible with the use of such steel. A display of electrical wires and cable, rail bonds, and other wire products used in the coal mining field. There will be a model tramway placed in a natural setting, samples of mine car wheels, rails, structural steel members for mines and other steel products used in the coal mining field.

● UTILITY MINE EQUIPMENT CO.: Will include Umeco Mechanical Loader, push and pull type Rail Bender Rerailer, Aluminum Rail Benders, four sizes, Aluminum Rail Punches, two sizes, Light Weight Jack Pipes.

● VIKING MANUFACTURING CO.: Will display the latest design and improved Viking Hot Vapor Coal Treating Equipment in actual operation.

● THE WATT CAR AND WHEEL CO.: Will show an unusual type of steel mine car with wood bumper fillers. The car is of unusual design, built for strength, capacity and low upkeep.

● WEIR KILBY CORP.: Will include actual units of such products as Titan frogs of both Titanium and manganese treated steel; switches; low clearance, parallel throw switch stands with adjustable throw; guard rail clamps and various other items of improved light rail and mine track work.

● THE WEST VIRGINIA RAIL CO.: Will present a complete line of steel mine ties, a room tunout with steel switch ties set up in operating position, and a standard built up rail frog, and heavy duty type and standard mine type manganese steel frogs. Also a new West Virginia Rail Bender will be shown. This is a new aluminum alloy, light weight rail bender operating under an entirely different principle.

● WESTINGHOUSE ELECTRIC & MFG. CO.: Will show in an unusually interesting manner the latest motor and control equipment as used on mining properties; line materials, gears, gear-motor, insulation, trolleys and testing instruments.

● THE WOOD PRESERVING CORP.: Will exhibit two 4-piece pre-framed creosoted oak driftmouth timber sets, backed with the necessary lagging; typical creosoted mine ties of various sizes, together with specimens of yellow pine poles. Illumined plates will show timber treating plant equipment and examples of various kinds of treated timbers in use in coal mines.

● WILLIAMSPORT WIRE ROPE COMPANY: Will present a Wire Rope Manufacturing Machine which is a moving mechanism which actually makes wire rope right before the eyes. In addition, it is planned to have several display samples of the various constructions and grades of wire rope.

Details of the exhibits of the following companies are not available as we go to press:

Allen-Sherman-Hoff Co.
American Cable Co.
Atlas Powder Co.
Broderick & Bascom Rope Co.
Bucyrus Erie Co.
Cincinnati Mine Machinery Co.
Coal Mine Equipment Sales Co.
L. P. Cavett Co.
Differential Steel Car Co.
Dorr Company, Inc.

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Calendar of Entertainment

MONDAY, MAY 11

8 P. M. to 2 A. M.—Octette . . . famous group from Old Heidelberg Restaurant . . . nationally known . . . an outstanding feature. **Ice-breaker** . . . Mr. McConnell . . . a grand fun maker . . . guaranteed to get crowd together. **Kelly-Bahlke Dancers** . . . in ensemble and specialty numbers . . . lovely girls . . . lovely costumes . . . exciting numbers. **World Famous Orchestra** . . . for dancing from 10 to 2.

TUESDAY, MAY 12

8 P. M. to 2 A. M.—Miners' National Amateur Contest . . . sponsored by leading coal companies . . . to determine the best talent among our 400,000 miners . . . winner to receive national air audition. **Kelly-Bahlke Dancers** . . . specialties. **Orchestra** . . . Dancing . . . **Plenty of fun.**

WEDNESDAY, MAY 13

8 P. M. to 2 A. M.—Kentucky Derby, Jr. . . . The running of the A. M. C. Handicap . . . only race in history that can be guaranteed to be won by a filly . . . jockeys—18 beautiful girls sponsored by coal companies. **Rhythm Cruise** . . . an entrancing trip from New York to San Francisco, via the Rhythm Cruise . . . a charming and unusual feature.

THURSDAY, MAY 14

6.30 P. M. to 2 A. M.—Annual "Speechless" Dinner . . . lives up to its reputation . . . the most important entertainment event of the convention, featuring: **Nationally Known Orchestra** . . . **Ward Wilson,** famous radio and stage comedian . . . **The "Dream Girl" Waltz** . . . a lovely interpretation of beautiful music by the Ballet . . . and **Miss Cornelia Otis Skinner** . . . famous daughter of Otis Skinner . . . in a few of her extraordinary character sketches . . . star of stage and radio . . . **Selections** from the **Octette** . . . who will play a "return engagement" . . . **Dancing** . . . A wonderful evening, not to be missed under any circumstances.

SPECIAL ENTERTAINMENT FOR THE LADIES

\+ + +

E. I. du Pont de Nemours & Co.
Edison Storage Battery Co.
Fairbanks, Morse & Co.
Flood City Brass & Electric Co.
General Explosives Division of the American Cyanamid & Chemical Corp.
Gould Storage Battery Co.
Grasselli Chemical Company.
Hockensmith Wheel & Mine Car Co.
Irwin Fdry. & Mine Car Co.
Koppel Industrial Car & Equipment Co.
Marion Steam Shovel Co.
Marlin Rockwell Corp.
McGraw-Hill Publishing Co.
Metal & Thermit Corp.
W. H. Miner, Inc.
Mining Congress Journal.
Mosebach Elec. & Supply Co.
Penna. Electrical Repair Co.
Phillips Mine & Mill Supply Co.
Post Glover Electric Co.
Princeton Foundry & Supply Co.
Frank Prox Company.
Roberts & Schaefer Co.
Robinson Ventilating Co.
John A. Roebling's Sons Co.
Joseph T. Ryerson & Son, Inc.
Sanford-Day Iron Works, Inc.
Solvay Sales Corp.
Texas Company.
Tide Water Oil Co.
Bertrand P. Tracy Co.
Universal Lubricating Co.
U. S. Bureau of Mines.
Western Cartridge Co.

L. W. Shugg
Director of Exhibits
(Courtesy of General Electric Co.)

Officials of The American Mining Congress will be in attendance. Howard I. Young, president, American Zinc, Lead & Smelting Company, and president of the organization, expects to attend for the entire week. In addition the coal directors of the organization, James D. Francis, president, Island Creek Coal Co.; W. J. Jenkins, president, Consolidated Coal Co.; A. B. Jessup, vice president, Jeddo-Highland Coal Co.; and Eugene McAuliffe, president, Union Pacific Coal Co., will be present. The importance of the convention and its unusualness have attracted an increasing number of important representatives of allied industries. This year is no exception, with many representatives of the copper, iron, lead, zinc, and miscellaneous minerals planning to attend.

J. F. Callbreath, secretary emeritus of The American Mining Congress, and for so many years its efficient secretary, who has been absent for the past two conventions because of illness, will attend the meeting. Julian D. Conover, secretary of the organization, and rapidly becoming well and favorably known throughout the coal fields, will take a prominent part in the meeting. A special meeting of the National Board of Directors has been called, to which has been invited a group of coal officials.

Details for the development of the convention and exposition have been directed by E. R. Coombes, assistant to the secretary, The American Mining Congress.

Cincinnati from the Air —*M. Parks Watson.*

Improving the POWER FACTOR

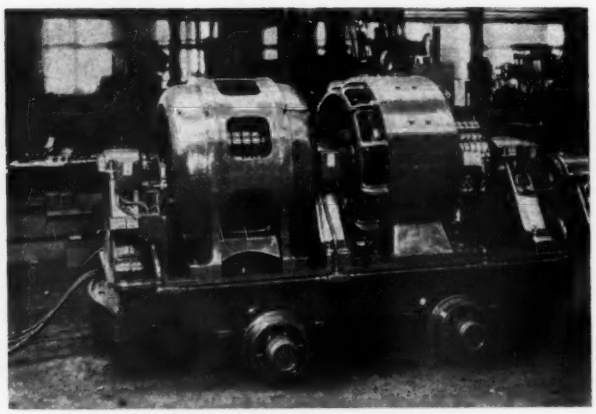
By C. E. CAWVEY*

THE POINTS of activity in a coal mine, under normal operation, are constantly moving away from the shaft bottom or entrance. Longer and heavier feeder cables are demanded as loading operations are gradually pushed farther away from the central power generating equipment. Eventually these operations at the point of loading the coal are so far away that it becomes no longer economical to purchase and install feeder copper; and d.c. power for mining must be generated at a point nearer the inside working sections.

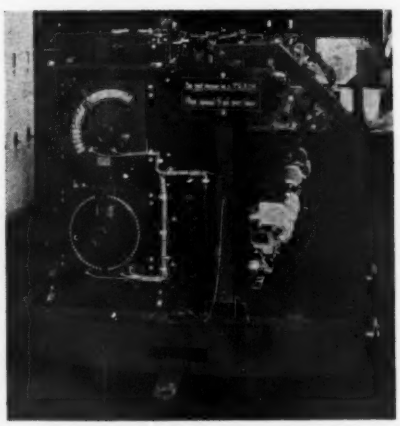
The latest addition to the underground generating equipment used at the Kathleen Mine of the Union Colliery Company is a Westinghouse portable motor generator set with full automatic switching. This underground substation can be disconnected, moved to a new location and reconnected at the new location in a very short time. Less than one shift is necessary to change the location of the equipment, provided the new substation location has been provided with an incoming high potential connection and a d.c. power cable connection.

The portable substation is very compact and consists of a 150 kw. 250 volt, d.c. generator driven by a 220 hp., 2,300 volt, 1,200 r.p.m., 80 percent p.f. 3 phase, 60 cycle synchronous motor; controlled by automatic switching equipment which protects against phase reversal, phase failure, a.c. low voltage, a.c. overload, field failure, overspeed, d.c. overload and short circuit, reverse current, reverse polarity and bearing overheating. The switch gear provides for automatic restarting after a.c. low voltage tripout and reclosing of the d.c. breaker after overload or short circuit, provided the cause of the trouble is removed from the distribution system.

The total equipment is mounted on two mine car trucks, the motor generator on the one end and the complete switching equipment on the other. These trucks are equipped with bumpers and couplings to facilitate movement in a train and a wheel base that allows them to travel anywhere in the mine where a mine haulage locomotive can travel. The journals are designed to allow all wheels a small amount of vertical movement which permits the wheels to follow uneven track and prevent derailments. The equipment has been moved over two miles of underground track with all the speed that is necessary for such equipment without a single derailment.



Mounted Motor Generator



End View, Mounted Switch Board

Incoming a.c. cable connections and a.c. connections between trucks are made with plug type receptacles, thus being easily and quickly disconnected and reconnected. Two thousand three hundred volt, 3-phase connections are available in all parts of the mine because this is the standard means of transmitting power inside the mine to the mining machinery. The cutting machines are equipped with 220 volt induction motors which obtain their power from transformer stations which are moved from time to time as the mining operations advance.

* Electrical Engineer, Union Colliery Co.

Because of the inductive load on the cables, the power factor is very low. The portable substation is connected to the a.c. distribution system and raises the power factor eliminating the heavy inductive current at the point of use and hence saves considerable loss in the 2,300 volt distribution network.

The d.c. connection, from this underground substation, is made to the feeder and trolley system which is fed by four other underground stations and also from generators in engine room on top.

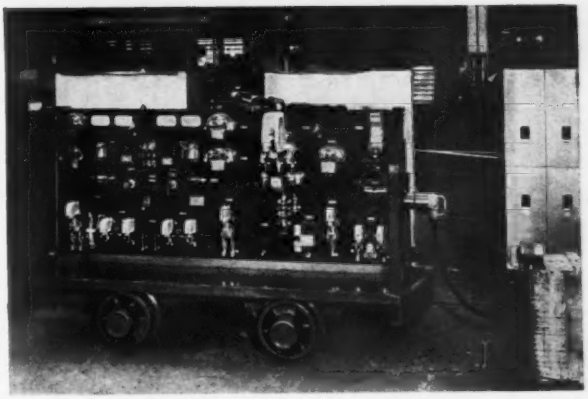
The section served by this substation consists of five gathering locomotives and four leading machines. In addition to this load there are two 15-ton haulage locomotives which make regular trips to the section served by this substation. It is impossible for this 150 kw. set to carry all this load without help, so to relieve the portable set the generator fields are so connected that a drooping voltage characteristic is obtained, thus shifting some of the load to the other sources of power. At full load the voltage of the set is 250 volts while the central generating station on the surface maintains 275 volts at all loads. Thus the station on top carries the overload and underground station instead of tripping the d.c. breaker furnishes its share of the d.c. load. When the load becomes light, such as noon hour when underground operations are stopped, the voltage of the set is 275, thus it does not trip out because of reverse current.

A generator large enough to carry these intermittent overloads at 275 volts would be so large it would not be mobile and portable and would require more expensive foundations and settings and an artificial means of dissipating the large amount of heat generated. With the small station no foundations are necessary except a well blocked leveled mine track and no ventilating fan or air filter is necessary. Also with a large set which carried the entire load the ratio of the average load to full load rating would be low thus reducing the average efficiency. With the generator, with the drooping voltage characteristic, when the load becomes light and the voltage high the d.c. excitation on the synchronous motor is at a maximum hence the greatest amount of corrective leading current is obtained, and when the load is heavy and the generator and motor are carrying an overload this motor excitation is lowered and hence that part of the kv-a. load on the motor is reduced, allowing it to carry its normal overload with less heating.

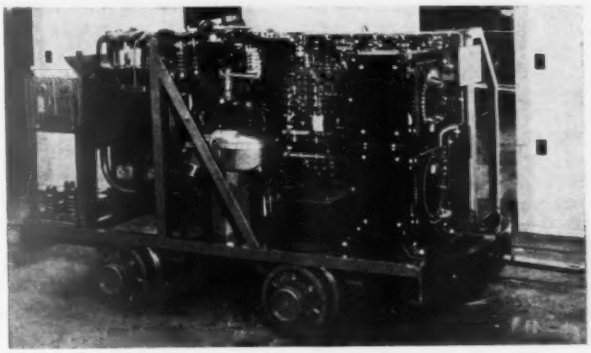
The total mine load is never leading and the power factor billing is based on the average power factor for a month figured from a reactive kv-a. hour meter reading for the month and the kw. hour meter reading for the same month. With this new motor generator set a maximum corrective kv-a. is obtained at periods of light load thus raising the power factor without a proportionate increase in the maximum demand.

When the power company serving the Kathleen mine first started penalizing for a power factor under 90 percent and granting a bonus for a power factor over 90 percent the average power factor for the month was 85 percent. Now without adding one single piece of equipment purely for the purpose of correcting lagging current the power factor for a month has been as high as 98 percent. The new Westinghouse synchronous motor generator set is one of the factors in obtaining this increase of 13 percent in the power factor.

The voltage at the loading machines is always satisfactory whether the haulage locomotive is on the inside parting starting out with the loads or leaving the bottom with a heavy train of empties. The voltage 3 miles from the bottom is as steady as it was when operations were only getting started away from the bottom when the mine was in its first stages of operation.



Front View, Mounted Switch Board



Rear View, Mounted Switch Board

Modern Explosives in Industry

(*Continued from page 57*)

largest operations the savings obtained with these explosives have been as high as 30 percent.

These modern explosives warrant your most serious attention, as they are being used by many operators today to cut costs on low-grade ores, or at other properties where mining costs must be kept to a minimum.

Tests to Determine the Most Suitable Explosive

In making tests to decide on the explosive to use, the matter must have the interest of the management if the results are to be of value. Further, tests must be made with a free mind.

Preconceived opinions or prejudices have no place in the selection of explosives. For example, an operation insisted on using an abnormally plastic gelatin. Later it was proved that hercomites (of no plasticity) were found to be better suited—and, incidentally, much cheaper, which is proof that preconceived opinions can be wrong in explosives selection. Another operation using gelatin at first refused to even try hercomite because, in their words, it was "too much like sawdust." Finally, after a month's satisfactory trial with gelamite, they tried a hercomite. Not only did they find it satisfactory but they saved considerable by the change.

The moral is: Select the explosives that give the best execution, economy, and safety. Be on the alert for changing conditions so that you will continue to use the best explosive for your property. And, don't forget, reliable explosives companies furnish you with more than good explosives—they have available also a staff of men to help you select and use these explosives correctly.

Explosives in the nineteenth century changed American civilization. Today they can be of equally important help to operators by contributing to lower costs in making available the metals, coal, and construction projects that make our civilization possible.

Mechanization Trends

Drainage, Ventilation, and Roof Support

IN THE New River coal field the seams, although *comparatively* flat nevertheless do dip slightly, averaging about 175 ft. to the mile, in a northwest direction. Along the northwest edge of the field the seam is low with reference to the surface, being entirely below water level even below the bed of New River at a point a short distance west of Hawks Nest station.

Along the southeast edge the seams have "climbed" the intervening topography and "come out" of the tops of the mountains. The southeastern outposts of the seams are round or oval areas near the tops of the highest mountain peaks and ridges. Northwest of these there are wide valley spaces of no coal area. Continuing in a northwesterly direction the barren valley areas become narrower, the seams become lower in reference to the surface, and the coal areas become larger and more extensive, being practically solid area on the northwest third of the field, roughly speaking.

As one easily surmises the relative positions of the seams and surface topography, lends itself to several types of drainage methods.

1. In the high southeast edge of the field, where there is considerable outcrop line, natural or gravity drainage usually with some ditching and a few small gathering pumps is the system used.

2. Northwest of this section of the coal field small pumps for gathering, and tunnels for natural drainage under the seams are used.

3. In the northwest solid area drainage is had by the all pump method.

Discussion of the above-mentioned drainage methods.

1. In the natural or gravity drainage the method with ditches and small pumps, there are two types of mines which lend themselves to this type of drainage plan.

(a) Those mines which are begun at the outcrop and developed toward the "rise" of the coal. In this type of mine the water flows back from the faces to the outside by gravity, and the drainage system consists of a few ditches, with probably a few small pumps temporarily located to raise the water out of local swags to points where it will run out by gravity.

In this case drainage is always behind the man at the face, and drainage is a very small part of the problem and expense of getting coal out.

(b) Those mines which are developed from the outcrop toward the dip of the coal, but which have outcrop on the opposite or low side of the coal area, and sometimes on the right and left sides also.

In this type of mine the advance workings, which are going to the dip are ahead of natural drainage. The drainage system consists of a series of ditches leading to openings driven to the outcrop, and also small pumps temporarily located to lift water from the faces and local swags back to the points where natural drainage has been established. Also in this type of mine, as ditches must necessarily lead forward in the same general direction as development that is toward the dip of seam knowledge of the irregularities of the seam, and the best location for ditches cannot be had until after developing entries have made the seam accessible for surveys. Thus it is that establishment of natural drainage in this type of mine is always a more or less definite period of time behind the forward development of the mine, sometimes causing a delay in pulling pillars, as compared with a mine going to the raise.

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Report, Committee on Mine Maintenance, New River, West Virginia District Coal Operators Committee, The American Mining Congress.

Owen W. Cox, Chairman, General Superintendent, Laurel Creek Coal Co.

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2. Small pumps and tunnels. This system is applicable to mines in which the whole or parts of the mine is developed from the outcrop toward the dip of the seam, but which does not have outcrop on the low or opposite side of the area. The pumps are used for concentrating the water from faces, swags, haulways, to the point where it will run out of the tunnel.

The tunnel is usually driven from a point on the outside far enough below the outcrop of the seam to allow the tunnel to be driven on an up grade 0.5 to 1.5 percent and enter the bottom of the coal seam at the lowest point of the area to be drained.

Sometimes the tunnel is driven in a small unworkable coal seam lying under the one to be drained, and then a slope driven up to the workable seam.

There is an advantage in following a small coal seam because the coal can be easily cut out, making room for the expansion of the rock when shot, instead of getting this expansion space by drilling and shooting "cutting" holes as is necessary where there is no coal seam.

These tunnels are varied in size and length. The most common sections of drainage tunnels are 4½ x 8, 5 x 7 and 6 ft. diameter round. Some of the factors which determine the shape and size of cross section are, quantity of water, length of tunnel, size of muck car, method of ventilation, method of transportation of muck, speed of driving, room for required number of men to work, and the way the rock shoots or breaks down.

3. All pump drainage. The type of mine which lends itself to this method of drainage is the shaft mine which has no outcrop, and the mine worked from the outcrop toward the dip, with no outcrop on the low side of the seam, and in which the driving of a drainage tunnel is not feasible.

Concentrating the water by means of small pumps and gravity is comparatively simple.

The most important part of this system of mine drainage is the setup for getting the water to the outside. The planning and installation of this setup in some instances may easily financially make or break the operating company, and because of its importance should be well planned, by men having knowledge, experience, and judgment. Knowledge of the coal seam, both the part of the area developed and that undeveloped, knowledge of the topography of the surface overlying the seam, of water quantity, and performance of pumps.

These setups for getting the water to the outside may be separated into four general classes. Some mines, however, use combinations of these classes.

No. 1. In which one or more centrifugal, or reciprocating pumps are set at strategic locations in the mines, and the discharge pipes laid along open entries or rooms to the shaft bottom, thence up the shaft to the outside.

No. 2. In which one or more centrifugal or reciprocating pumps are set at strategic locations in the mine and the discharge pipe carried out bore holes to the surface.

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COAL OPERATORS COMMITTEES OF THE AMERICAN MINING CONGRESS

A few months ago the Operators Committees met and selected a number of subjects that were to be studied by the District Committees. This work has proceeded at a very rapid pace and a large number of reports as listed below have been compiled. The data submitted is very comprehensive in illustrating the different methods and equipment used in the various fields. With this information as a basis the National Project Committees are now preparing a series of reports which will show the best practices in each phase of operation that have been developed to meet the varying conditions encountered underground.

CONVEYOR LOADING

No. 1—Central Pennsylvania, T. F. McCarthy, Chairman
No. 30—Colorado, Wyoming and Montana, G. B. Pryde

MECHANICAL LOADING

No. 2—Southcentral Illinois, H. A. Treadwell, Chairman
No. 19—Ohio, W. F. Hazen, Chairman

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No. 7—New River, W. Va., C. C. Ballard, Chairman
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No. 21—Pittsburgh, G. A. Shoemaker, Chairman
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No. 33—Colorado, Wyoming, and Montana, G. B. Pryde
No. 34—Northern West Virginia, L. B. Abbott, Chairman
No. 35—Northern West Virginia, L. B. Abbott, Chairman
No. 36—Northern West Virginia, L. B. Abbott, Chairman

POWER DISTRIBUTION

No. 9—Southcentral Illinois, Carl Lee, Chairman
No. 10—Northern West Virginia, M. W. Horgan, Chairman
No. 11—New River, W. Va., S. Austin Caperton, Chairman
No. 12—Northern West Virginia, M. W. Horgan, Chairman
No. 23—Pittsburgh, C. W. Gibbs, Chairman
No. 25—Rail Resistance Chart, M. W. Horgan, F. L. Stone
No. 26—Ohio, L. P. Crecelius, Chairman

COAL MINE HAULAGE ROADS

No. 15—Wood Ties on Main Haulage, R. V. Clay

CUTTING BIT TREATMENT

No. 17—Virginia, Joseph L. Osler, Chairman
No. 18—Southcentral Illinois, D. D. Wilcox, Chairman
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No. 24—Pittsburgh, Pa., George Osler, Chairman
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No. 5—Utah, Thomas C. Harvey, Chairman
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No. 27—Utah, District Committee
No. 28—New River, W. Va., J. M. Clark, Chairman
No. 29—Central Pennsylvania, T. F. McCarthy, Chairman
No. 40—Northern West Virginia, W. W. Dartnell, Chairman

ROOF SUPPORT

No. 14—Ohio, A. R. Joyce, Chairman

SAFETY

No. 3—New River, W. Va., Wm. Crichton, Chairman
No. 4—Montana, Albert Gately, Chairman
No. 16—Ohio, W. F. Hazen, Chairman
No. 22—Southcentral Illinois, Geo. Lindsay, Chairman
No. 39—Pittsburgh, Pa., F. T. Fitzharris, Chairman

VENTILATION

No. 13—Virginia, J. J. Sellers, Chairman
No. 31—Colorado, Wyoming and Montana, G. B. Pryde

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No. 3. In which turbine deep well pumps are set in bore holes driven to strategic locations in the mine and the discharge carried out the same bore hole.

In this type of pump the motor sets on top of the hole, and the shaft of the motor with the necessary number of impellors fastened thereto is let down the hole until the impellors are on the coal or proper height to engage and pump the water, the other end of the shaft of course is the shaft of the motor.

The motor revolves the long shaft with the impellors attached thereto thus forcing the water out the same bore hole between the shaft compartment and the casing of the hole.

These pumps are made in capacity of from 20 to 6,000 gals. per minute. The diameter of bore hole ranging from 4 to 26 in.

There are some 10 or 12 installations of this type of pump in the New River Field, ranging from 600 gals. per minute to 1,400 gals. per minute.

The efficiency of the turbine pump is about 7 percent less than that of the horizontal centrifugal, but it has advantages which often make it more economical over a period of time, such as attendance economies, no pipe line maintenance, less frictional head, accessibility of pump from the outside, no moving of pumps and pipe lines back when retreating from the area, no danger of being drowned out with water, etc.

No. 4. I do not know of any setup in the New River Field which hoists the water out the shaft with water skip and rope.

VENTILATION

For convenience of discussion, the subject of ventilation may be separated into three headings.

1. Description of the mine itself, including the entries carrying the air with or without rock dusting, humidification, sprinkling, etc., and devices for boosting, deflecting, splitting and diffusing the air currents.

2. Description of the air current it-

self, including size, pressure, velocity and composition.

3. Description of the fan or other apparatus used for motivating the air circuit in the mine.

1. The mine itself. In the New River Field the two entry mains is practically discarded except in very small mines. The three entry mains once very popular is still continued in some mines, and has proven satisfactory up to certain lengths of air circuit.

The four entry mains is used widely, and is popular in the medium sized mines. A few mines have the five entry mains, but the six, and seven main entry system is used widely for development of large coal areas.

The system of smaller number of parallel entry mains goes with small tonnage, small coal area to be developed, and short expected air circuit.

The system of large number of parallel entry mains goes with large tonnage, large coal area and long expected air circuit.

Overcasts—Stone, concrete and pipe overcasts are all being used for permanent overcasts.

Brattices—Mortar and stone, concrete, brick and cinder blocks are all being used for permanent brattices, while curtains, wood, tile, and dry wall and gob are being used for temporary brattices.

Rock Dusting—Is used "mildly" in non-gaseous mines and intensively in gaseous mines, and is the most popular method used for dampening and smothering the embryo explosion.

2. Air Current. Quantities range from 25,000 to 300,000 cu. ft. per minute.

The most common water gauge is about 1½ to 2 in., although there are cases exceeding these figures.

Gas Content. In the larger more gaseous mines samples of main air are analysed at regular intervals to keep check on methane content.

3. Fans. The fire and chimney, as a ventilating air column motivator is entirely obsolete in the New River Field. I know of one small mine which has a 30 ft. air shaft in use as an air disturber, but although natural ventilation is still acting in some of the small older mines, yet it is not depended on exclusively any more for ventilation.

The one, practically exclusive, apparatus in use today to induce the flow of air in mines is the fan.

There are four types:

"A"—The disk.

"B"—The propellor.

"C"—The centrifugal.

"D"—The blower.

"A" The disk fan is very common on properties where there is much outcrop as in the southeastern half of the field. Here the air circuit may be shortened from time to time by driving air ways to the outcrop and moving up the fan, or instead of using only one ventilating fan for the whole mine, two or three may be used in properties where the outcrop cuts the coal area up into areas favorable to separate ventilation.

The disk fan is indicated for small volumes (under 50,000 cu. ft. per min.) and low water gauge (below ¾ in.). Its use, however, is on the wane and it is already being replaced by the propellor type of fan.

"B" The propellor, or screw type fan is an adaptation of the aeroplane propellor to ventilation.

Because of its higher mechanical efficiency, because it will operate on pressures up to 2 in. of water gauge with much larger volumes and because it will work efficiently on more varied conditions of pressure, the single stage propellor type fan is rapidly replacing the old type disk fan, and also some centrifugal fans which have been working under conditions of pressures adverse to bringing out their true efficiency.

It is a fan capable of taking over the work of the disk fan with very little difference in cost and installation, and also part of the work of the centrifugal fan in the lower pressures with considerable saving in first cost and installation.

By multistaging this type fan, I have read (Trans. A. I. M. E. Vol. 102 Page 91) that there have been fans designed to work on a water gauge pressure of 14 inches with 70 percent efficiency.

"C" The centrifugal fan. This type fan is the one doing the heavy duty work, large volumes, under high water gauges, in the New River Field today. It is the wheel horse of the fans. These fans have been built with capacities up to 800,000 cu. ft. per min., and to work against mine resistances up to 10 in. water gauge, however I do not know of any installations in the New River Field which even approach this heavy duty.

I think the most common duty in this field is around 150,000 to 200,000 cu. ft. per min. and mine resistance of about 1½ to 2 in. water gauge. At shaft mines in the New River Field the quantity will average about 180,000 cu. ft. per min. against about 2 in. water gauge pressure.

"D" The blower type fan is used almost exclusively on auxiliary ventilation, to help distribution of air in local parts of mines, more being used in connection with conveyor mining than in any other duty.

Roof Support

For discussion purposes this subject is divided into five sections.

"A"—Driftmouth supports

"B"—Main Haulage supports

"C"—Side Haulage supports

"D"—Air Course supports

"E"—Room supports

"A" Drift mouths in the New River Field are largely supported by three member 12 x 12 wooden sets 3 to 4 ft. apart with 3 in. lagging top and sides between. Collars are usually 12 ft. long and legs 7 ft. high set on mud sills or 6 ft. high set on low concrete walls.

Masonry and concrete arches and masonry and concrete side and wing walls with flat reenforced concrete slabs for top, are also in common practice.

"B" Main haulage supports are avoided as much as possible. Where used they are principally of 10 x 10 oak. Although some "H," "I" and channel section steel beams are used, they are not common practice. Steel rails are also used to some extent but are not nearly as common as wooden sets.

"C" Side entry supports are also avoided as much as possible. Where used they are principally of run of forest round timbers. There is very little steel used on side entries.

"D" Room supports are principally run of forest round timbers. The best practice indicates that each company should have very definite rules as to number and position of posts to be set.

There are a large number of companies in the New River Field which do have definite rules for room support covering size of cap, size of post, distance posts are set apart, distance posts must be from rail, distance from last post to face, number and location of temporary posts at face, number and location of posts at room mouth.

Book Review

MINING HANDBOOK OF AUSTRALIA, 1936, by Editorial Staff of the *Chemical Engineering and Mining Review*. 480 pages (including 50 pages of numbered, interleaved advertisements), flexible binding, 6 by 9 in. Tait Publishing Co., 349 Collins St., Melbourne, Australia. Price, 21 shillings or about $5.

The renewed activity in mining throughout the world, especially for gold, has caused a need for directories of the companies so engaged. In the United States, since *The Mines Handbook* ceased publication, a new directory has appeared, also one in Canada. *Skinner's Mining Manual* (London) is the best of its kind—for its scope. Recently, in Australia, appeared the book under review. It was really needed because there has been great expansion of mining operations on the mainland and adjacent islands. Australian capital—mainly Adelaide, Melbourne, and Sydney—is interested in mines in the six states, in North and Central Australia (Federal territory), in New Guinea, and Papua, in New Zealand, in Fiji, in Malaya, in Siam, and in the Philippines. Hence, all of the companies doing business are listed, alphabetically throughout. A listing under the different countries would be an improvement, instead of all under Australia. The *Mining Handbook of Australia* follows the general style of such reference works—company name, officers, capitalization and organization, the property and type of ore, production, and financial condition. Prefacing this information are tables of Australian mineral production, and metal prices for 25 years, a glossary of mining terms, calculation of value of gold mining shares, costs of mining operations, and the mining laws of Australian States, New Guinea, and Fiji. A useful compilation.—*M. W. von Bernewitz.*

News and Views

of Interest to Mining Men

● SUSPENSION of annual assessment work on mining claims for the year ending July 1, 1936, was voted by the House on April 20 when it substituted the Hatch Bill (S. 3669) for the Ayers Bill (H. R. 12190), its identical companion in the House. It provides exemption from the annual requirements on not to exceed six lode mining claims held by the same individual, nor 12 such claims held by the same partnership, association or corporation; similar provisions apply to placer mining claims. The measure now goes to the White House for presidential approval, which is anticipated at an early date.

● VINCENT M. MILES, member of the Social Security Board, in addressing the Lynchburg, Va., Chamber of Commerce on April 9, stated in part:

"Because of the taxes on payrolls, the statement has been made that the effect of the Social Security Act will be to stimulate increased use of labor-saving machinery. Mechanization is going on as fast as possible in most industries anyhow. Indeed, it has advanced so rapidly during the depression as to complicate gravely the unemployment problem. In highly mechanized industries the cost of labor is relatively small. Hence the 1 percent tax on wages paid in 1936 will not be a large factor in the cost of production. Quite likely it will not be a large enough factor to justify more mechanization. For it must be remembered that mechanization has its costs which must be amortized over a period of years. Unless mechanization 'pay,' it will not come any the faster because of the payroll tax. *If it 'pays,' it will come anyway.*

"In those cases in which mechanization is increased, it will act as a factor of economy, and should be reflected in lower prices which in turn will increase real wages to workers and provide an ever-expanding market for greater and greater production. In short, an increase in employment rather than a decrease is perfectly possible."

● THE 33rd semi-annual meeting of the National Petroleum Association was held at Cleveland, Ohio, April 16 and 17, 1936.

● THE CONNECTICUT CHAMBER OF COMMERCE has announced that Cornelius F. Kelley will be the principal speaker at the 37th annual banquet of the association at the Hotel Bond, Hartford, on May 26. Governor Wilbur L. Gross and Mayor Thomas J. Spellacy of Hartford, will extend welcome greetings.

● T. M. GIRDLER, president of the Republic Steel Corporation was guest speaker at the annual dinner in connection with the 18th annual convention of the American Zinc Institute at the Hotel Statler, in St. Louis, Monday, April 20.

● JONES & LAUGHLIN STEEL CORPORATION, Pittsburgh, recently announced the resignation of G. M. Laughlin, Jr., chairman of the board. The election of H. E. Lewis as a director, a member of the executive committee and chairman of the board, effective April 7 was also announced.

The corporation announced the resignation of W. C. Moreland as a vice president and a member of the executive committee. Mr. Laughlin and Mr. Moreland will continue as directors of the corporation and Mr. Laughlin will continue as a member of the executive committee.

● UNITED STATES BUREAU OF MINES states that during 1935 production of 177,154 short tons of crude magnesite was reported from two mines in California and one in Washington. This was an increase of 75.4 percent over the quantity mined in 1934 (100,973 tons), and came within about 5.6 percent of the production of 1929 (187,660 tons).

The total consumption of domestic magnesite was higher than in 1934. Sales of magnesite of domestic origin in 1935, as reported by producers, were 1,626 short tons of crude, valued at $22,345, an increase of 2.4 percent in quantity and 21.5 percent in value compared with 1934; 10,710 short tons of calcined, valued at $317,276, an increase of 42.3 percent in quantity and 42.7 percent in value over 1934; and 67,777 short tons of dead-burned, valued at $1,214,999, an increase of 75.9 percent in quantity and 81.3 percent in value over 1934. There were increases in the quantities sold for refractory and plastic material in 1935.

● THE TREND toward Federal regulation of the natural resource industries and the broad economic effects involved will be fully examined at a special round table conference in connection with the United States Chamber of Commerce meeting. Discussion at this conference will revolve around three general topics:

Progress and Prospects of Western Mining

State Responsibilities Concerning Forest Resources

State Responsibilities Concerning Petroleum and Natural Gas Resources.

The Chamber, in announcing this special session, points out that "until recent years, these industries have not been objects of government control. Right now the government is engaged in an experiment of controlling an outstanding natural resource industry—bituminous coal. The very magnitude and vital place of such industries as mining, forest and petroleum appear to tempt a major test of government's relation to business enterprise.

"Control proposals, in the light of recent experience, have emphasized to these industries the necessity for carefully weighing the possible effects of government regulation upon their outstanding place in the general economic welfare. The economic, social and governmental activities of states and communities are involved; and the responsibilities of the natural resource states for proper laws to promote the welfare of these industries and their communities are challenged. This meeting will afford opportunity for discussion of these vital questions in the natural resources field."

● NECESSARILY postponed because of the blizzards and heavy snows that paralyzed transportation during the latter part of January, the conference on "New Trends in the Utilization of Fluorspar," originally scheduled to be held at Rosiclare, Ill., on January 24, will be held on Friday, May 22.

As stated by Dr. M. M. Leighton, chief of the Illinois State Geological Survey Division of the Department of Registration and Education, the purpose of the conference is to reveal to all who are interested in the mining and use of fluorspar, the character of researches now in progress, which are expected to bring to light new uses and widen the market field for this mineral, which is extensively used in the steel, aluminum and chemical industries. Approximately 90 percent of the fluorspar produced in the United States comes from the southern Illinois and western Kentucky field, and this locality is ranked as the most important fluorspar producing region in the world.

The conference at Rosiclare, in the heart of the mining area, will be sponsored jointly by the Illinois State Geological Survey, the U. S. Geological Survey, and the fluorspar producers of the Illinois-Kentucky district.

The program calls for an afternoon and evening session on the day of the conference, with C. B. Fox, president of the Aluminum Ore Co., of E. St. Louis; and Dean Walter McCourt, Vice Chancellor of Washington University, St. Louis, serving as chairmen.

Dr. Leighton will deliver an address on "A Program of Researches on Fluorspar." W. H. Voskuil, mineral economist of the State Geological Survey, will

Preparation Plant, No. 4 Mine, Pond Creek Pocahontas Company

speak on "Economic Aspects of the Fluorspar Industry." F. H. Reed, chief chemist of the Geological Survey, will give a paper on "Fluorspar as a Chemical Raw Material." "The Future of Fluorspar in the Ceramic Industry" will be the subject of a talk by C. W. Parmelee, head of the Department of Ceramic Engineering, University of Illinois. C. F. Fryling, chemist of the Geological Survey, will speak on "Reaction of Fluorspar in Silicate Melts." L. W. Currier, staff geologist of the U. S. Geological Survey, will present a geological interpretation of fluorspar reserves. The meeting will close with a talk by M. King Hubbert, geophysicist of the Illinois Geological Survey and Instructor at Columbia University. He will speak on "An Electrical Method of Exploration for Fluorspar."

About 100 people are expected to attend the sessions, which will be held at the Y. M. C. A. in Rosiclare.

● THE 4TH ANNUAL MINERAL INDUSTRIES CONFERENCE of Illinois was held on April 24-25, at Urbana, Illinois. The objectives of the conference were presented by M. M. Leighton, chief, Illinois State Geological Survey, followed by a paper on "Research and the Immediate Future" by Fred Wesley Sargent, president, Chicago and Northwestern Railway Company. A forum on Coal Researches was presented as follows: Classification of Illinois Coals—G. H. Cady, Senior Geologist, Illinois State Geological Survey; Coal Preparation and Utilization—D. R. Mitchell, Assistant Professor of Mining and Metallurgical Engineering, University of Illinois; Constitution of Coal in Relation to its Use—L. C. McCabe, Assistant Geologist, Illinois State Geological Survey; Standardization in Coal Analysis and its Application to Plant Control and Marketing—O. W. Rees, Associate Chemist, Illinois State Geological Survey; Smokeless Briquets from Illinois Coal Mines—R. J. Piersol, Physicist, Illinois State Geological Survey; Carbonization of Illinois Coals—G. Thiessen, Associate Chemist, Illinois State Geological Survey; Inventorying of Illinois' Coal Resources—J. M. Weller, Geologist, Illinois State Geological Survey.

A session covering Symposia on Needed Researches was chaired by W. J. Jenkins, president, Illinois Coal Operators' Association, with papers presented as follows: Factors to be Investigated in the Satisfactory Stoker Use of Illinois Coals—C. V. Beck, president, St. Louis Coal Company, St. Louis; Federal Regulations of the Bituminous Coal Industry—George W. Reed, vice president, Peabody Coal Company, Chicago, and chairman, Bituminous Coal Producers' Board for District 10; The Regulation of Moisture in Coal as a Factor in Beneficiation—T. E. Shaughnessy, combustion engineer, Northern Illinois Coal Company, Chicago; The Significance of Hydrogenation with Respect to Illinois Coal—F. H. Reed, chief chemist, and G. Thiessen, associate chemist, Illinois State Geological Survey.

Forums were also devoted to Oil and Gas Researches, Clay and Clay Products Researches, and Rock and Rock Products Researches.

The annual minerals industries dinner was held on Friday evening, April 24, with Frank W. DeWolf, head, Dept. of Geology, University of Illinois, presiding as toastmaster.

Plans for a future research program and research facilities were discussed at the all-mineral-industries luncheon on April 24, chaired by T. J. Thomas, president, Valier Coal Co.

● THE AMERICAN ZINC INSTITUTE, INC., held its 18th annual meeting at St. Louis, Mo., April 20-21. The meeting was addressed by Howard I. Young, president of the Institute and president, American Zinc, Lead & Smelting Company. John A. Robinson, president, Tri-State Zinc & Lead Ore Producers Association, responded to the address of welcome by T. N. Dysart, president, St. Louis Chamber of Commerce. Among the papers presented were "Legislative Developments Affecting Zinc," by Julian D. Conover, secretary, the American Mining Congress; "The Zinc Market," by C. S. J. Trench, president, C. S. Trench & Co., Inc.; "Air Hygiene Foundation of America—Its Organization and Objectives," by H. B. Meller, managing director; and "Modern Research Methods," by Clyde E. Williams, director, Battelle Memorial Institute. Galvanizing Practice and Problems were discussed by W. E. Buck, Granite City Steel Co.; B. P. Finkbone, American Rolling Mill Co.; P. R. Russell, Grasselli Chemical Co.; G. A. Brayton, Newport Rolling Mill Co.; J. L. Schueler, Continental Steel Corp., and G. C. Bartells, American Zinc Institute, Inc.

The annual dinner and smoker was held on Monday evening, April 20, with T. M. Girdler, president, Republic Steel Corporation, as guest speaker.

A general exhibit of galvanized products was displayed at the meeting.

● TWENTY-ONE AWARDS, comprising eight medals and 13 certificates, for outstanding acts of heroism were voted employes of the mining industries at the recent annual meeting of the Joseph A. Holmes Safety Association in Washington. In addition, 88 certificates were awarded to mines or plants for good safety records and 14 to individuals for long-time employment without injury.

Seventeen iron mines in the Lake Superior district have been awarded certificates of honor for excellent safety performance, by the Joseph A. Holmes Safety Association.

All mines of Pickands, Mather & Co. in Minnesota received the award as a group for the year 1935. The individual awards to mines of this company were for the year 1935 or longer. The mines in Minnesota were the Albany, Bennett, Biwabik, Mahnomen, Scranton, Mahoning, Sagamore and Zenith. The Michigan mines were East Vulcan, James, Plymouth and Sunday Lake.

Certificates of honor mines of The M. A. Hanna Co. were the Mesabi Chief and Mississippi properties in Minnesota and the Richmond and Wakefield mine in Michigan. The No. 6 Shaft at the Montreal mine of the Montreal Mining Co., at Montreal, Wis., and the property of the Vinegar Hill Zinc Co., at Plattville, Wis., also received certificates of honor.

● THE NATIONAL LABOR RELATIONS BOARD ruled that labor unions must decide for themselves what elected officials are to represent their views and that the board has jurisdiction only to demand recognition by employers of the

workers' right to bargain collectively through representatives of their own choosing, the board held.

The ruling was based upon a petition of the Aluminum Workers at the Alcoa, Tenn., plant of the Aluminum Company of America, asking that it be designated as the only body authorized to represent the men at that plant, the case grew out of attempts of several local unions to form an international federation of aluminum workers and an internal struggle between labor executives for control.

"It is preferable that the board should not interfere with the internal affairs of labor organizations," said the decision. "Self-organization of employes implies a policy of self-management. The role that organizations of employes eventually must play in the structure established by Congress through that act is a large and vital one.

"They will best be able to perform that role if they are permitted freely to work out the solutions to their own internal problems. In its permanent operation the act envisages cohesive organizations, well-constructed and intelligently guided. Such organizations will not develop if they are led to look elsewhere for the solutions to such problems.

"In fine, the policy of the National Labor Relations Act is to encourage the procedure of collective bargaining and to protect employes in the exercise of the rights guaranteed to them from the denial and interference of employers. That policy can best be advanced by the board's devoting its attention to controversies that concern such fundamental matters."

The board ruled that the union's petition should be dismissed.

● MYRON C. TAYLOR, chairman of the United States Steel Corporation, in addressing the stockholders at the 35th annual meeting held on April 6, reviewed the basic lines of policy which have guided the Corporation's affairs since he had been identified with the management and in doing this he rendered an account of results covering a period from January 1, 1928 to December 31, 1935. In part Mr. Taylor said:

"While our operating schedules have been gradually gaining, they are still far from satisfactory, and this is directly due to the fact that there is, as yet, restricted movement in the field of heavy rolled products. The rate of operations at the present time is at the highest level it has been since 1930, and we are hopeful that this improvement will continue, and that the present operating basis may gradually expand until we reach a normal basis of production. If one considers the accumulated need of the country for steel for replacement purposes, due to ordinary wear and tear as well as to obsolescence in all the capital goods industries, the conclusion is inescapable that either now or very soon in the future these needs must be satisfied, else all commerce and all industry in the nation will suffer very great injury."

Regarding salaries paid to officials in the corporation, Mr. Taylor pointed out that the salaries are filed with the SEC and are made public. He admitted stockholders might protest what they consider high salaries but they do not know all the conditions. He claimed that a competitive situation exists in connection with the men best qualified for the various positions, and insisted that liberal

salaries were necessary when bidding for such services.

Mr. Taylor pointed out that the officers' remuneration was commensurate with the size of the enterprise and said that it was difficult to secure men from private business to enter the U. S. Steel Corporation because the opportunity offered in private business for larger remuneration was greater.

"I think too many of us take too narrow a view of the whole salary question," Mr. Taylor said. "I do not like anyone to attack this compensation question without knowing what they are doing.

Mr. Taylor also called the attention of stockholders to the fact that a substantial part of an official's salary is returned to the government in the form of taxes.

● LAKE SUPERIOR iron ore shipments for 1935 amounted to 28,503,501 tons, an increase of 29 percent over 1934. There were 124 mines on the shipping list, the average shipment per mine being 229,867 tons. Of the total shipment 28,358,809 tons came from Upper Lake ports and 144,692 tons were shipped all rail, largely from the Marquette range. The all rail shipments were more than double those of last year.

The 1935 figures compare with a shipment of 22,063,824 tons from 122 mines in 1934, and 21,672,410 tons from 122 mines in 1933. In the record year of 1929, the output was 66,157,359 tons, shipped by 171 mines.

● AMERICAN METAL MARKET announces the publication of the twenty-ninth annual edition of *Metal Statistics*. Besides a collection of useful and informative data on economic subjects, this handy, coat-pocket size book furnishes in its usual complete and compact form a record of production, consumption, imports, exports, stocks, price fluctuations and averages (monthly and annually), data on various brands, analyses, trade terms, custom duties, etc., applying to finished and semi-finished ferrous and nonferrous metal products as well as raw materials.

The 1936 edition has been further enlarged by the addition of monthly average price tables on six classifications of scrap iron and steel, as well as numerous additions and enlargements in the tin, lead, silver, and gold sections of the book. In the copper department will be found five new pages of statistics on production, consumption, and stocks in 1935, compiled from official monthly reports of Copper Institute, Inc., which undoubtedly will be interesting and useful to the trade.

• PLANS for the program for the Third Short Course in Coal Utilization to be held at the University of Illinois, Urbana, on June 9, 10, 11, are progressing rapidly, and only a few more acceptances from invited speakers are necessary to complete the program. Last year the short course was attended by 215 men from 18 states, representing a 50 percent increase over the attendance in 1934. Judging from the number of requests for information received up to the present it seems that an even larger attendance is certain this year, perhaps exceeding the 400 mark.

The Short Course in Coal Utilization is under the personal direction of Prof. A. C. Callen, head of the Department of Mining and Metallurgical Engineering, and Prof. D. R. Mitchell, of the same department. Papers will be presented by them and by other faculty members, and by a large number of prominent men from the industrial field. The papers to be prepared and presented by industrial and faculty experts who have already definitely accepted a place on the program are:

New Developments in Stokers: B. M. Guthrie, chief engineer, Stoker Division, Fairbanks, Morse and Company, Chicago.

Elementary Calculations for Domestic Stoker Installations: Frank J. Hoke, vice president, Holcomb and Hoke Manufacturing Company, Indianapolis.

B.t.u. Determinations: Prof. A. C. Callen.

Preparation and Utilization of Coal for—Domestic Fuel: Prof. D. R. Mitchell. Small Steam Plants: L. A. Shipman, combustion engineer, Southern Coal and Coke Company, Knoxville, Tenn. Large Steam Plants: J. G. Worker, general sales manager, American Engineering Company, Philadelphia. Railroads: Prof. E. G. Young, Department of Railway Engineering, University of Illinois.

Problems of Retail Fuel Marketing: Norvin H. Vaughan, assistant general sales agent, Consolidated Coal Company, Chicago.

Selling Heat Service vs. Selling Coal: Paul D. Hess, Heat Service Inc., Macon Mo.

Sampling Coal Shipments: Prof. D. R. Mitchell.

Types of Solid Fuel: Prof. A. C. Callen.

What's What in Air Conditioning: Prof. M. K. Fahnestock, Department of Mechanical Engineering, University of Illinois.

One of the interesting features of the session on the afternoon of June 10 will be a "Question Box." Questions may be deposited until noon and will be answered by members of the university staff or by specially selected men from industry.

It is expected that a final announcement covering the entire program and list of speakers will be ready for distribution before May 1. Requests for copies may be sent Prof. A. C. Callen, 209 Transportation Building, Urbana, Ill.

● HECLA MINING COMPANY has surprised its stockholders by raising its dividend rate from 10 cents a quarter to 15 cents. The disbursement will be made May 25, to stockholders of record April 25 and amounts to $150,000. This brings the company's total dividends to $21,155,000. This company suspended dividends during the worst of the depression but has been paying 10 cents a share for two and a half years. At the annual meeting in Spokane, Wash., April 15, the board of directors was reelected and James F. McCarthy continued as president. Fred Searls, of New York, vice-president of the Newmont Company, is the new member of the Hecla board. He attended the meeting and inspected the Hecla mine and the Hecla's Polaris development.

President McCarthy reports that Hecla has two important mill construction enterprises in contemplation. One is a plant to treat the Polaris ore and will be situated, it is understood, near the mouth of the recently finished Polaris tunnel and near the O-W railroad. Besides this the Sullivan Mining Company, owned jointly by the Hecla and Bunker Hill companies, plans to install a mill to reduce the zinc ores, coming from the Star mine through the Hecla workings. The ore has been treated recently at the Hercules mill, near Wallace, held by the Sullivan Company under a short time lease.

In his annual report, President McCarthy stated that Hecla's tax levy in 1935 was 21.3 percent of the company's profits. "It is a severe tax on a wasting industry," Mr. McCarthy said. "It re-

quires slightly more than one day's operation a week to pay the tax levy."

● THERE IS intense activity in the "dry ore" belt of the Coeur d'Alenes in Idaho. Dr. John W. Finch, director of the U. S. Bureau of Mines, has rechristened this the "silver belt of the Coeur d'Alenes."

R. D. Leisk has been made assistant manager of the Sunshine Mining Company. He was formerly with the United Verde Copper Company. Frank Eichelberger, who has well under way all his extensive plans for the enlargement of the Sunshine operations, will now give less attention to this work and it is reported he is considering the acceptance of the management of certain other mining enterprises being developed in the silver belt district. He already is in charge of the development of Sunshine Consolidated. His name also is coupled with the management of the Silver Summit, and of the Galena mine, which has been inactive for the last few years. The Galena is owned by Callahan Zinc-Lead Company of which Donald A. Callahan is president. It adjoins on the west the city of Wallace.

East of the Sunshine lies the Silver Dollar and east of the Silver Dollar is the Silver Summit. The Silver Summit Company has a stockholders meeting called for May 8, to consider a proposed increase in capitalization from 1,500,000 shares to 2,500,000. The additional stock will be used to complete the development of the property. Harry Pearson, president and manager of the Silver Summit, has returned recently from New York. Mr. Pearson has had the contract for the two-mile Polaris tunnel.

Development of the Silver Dollar is being made by a tunnel already more than 7,000 ft. long to cut the Polaris vein and reach the Sunshine vein. W. J. Stratten, of Spokane, is president of the Silver Dollar Company.

Heaviest purchases of copper in any buying movement for a number of years preceded the advance of ¼-cent to 9½ cents. Total sales of 126,000 tons in four days placed consumers in a well-supplied position.

The March statistics published during the week of April 13, revealed an increase in domestic stocks, despite larger deliveries into consumption. World figures for March were regarded as indicating a balanced supply and demand position.

Sales of lead improved at unchanged prices. While sales of zinc were small at unchanged prices, indications of increasing consumption, based on larger shipments on old orders, were said to create a favorable outlook.

● NO CONCERN is manifested by the Social Security Board over the recent decision of a New York State lower court which held invalid the New York unemployment compensation law. A previous decision from a court of equal jurisdiction in upstate New York had held the law valid. The latest decision is being appealed to the New York high court and is eventually expected to reach the Supreme Court.

The Social Security Board points out that while the New York law may be unconstitutional under the New York constitution, that does not necessarily invalidate the California, New Hampshire, or any one of the 20 other State laws. The New York decision will not hinder the payment by the Federal Government of its share of the administrative expense of operating the New York law, provided for by the Federal Act for all States which enact laws in conformity with the standards set by the Federal Act. Until the New York Act is finally passed upon, the Board will probably continue to permit the usual 90 percent deductions against the Federal 1 percent tax, to New York State employers paying the Federal tax.—*A. M. C. Bulletin.*

● THE NATIONAL LABOR RELATIONS BOARD announced March 23, that during the month of February, 1936, the Board and its 21 Regional Offices have received charges and petitions for elections in 65 new cases, involving 5,364 workers. The cumulative figures of all the Board's activity, from the time it began operations last fall until March 1, 1936, show that the Board and its Regional Offices have acted in a total of 641 cases involving 146,245 workers.

An analysis of the causes of complaints shows that 235 of the total number of cases concerned Section 8 (3) of the Act, which makes it an unfair labor practice to discriminate against workers because of their union affiliation or activities. In 189 cases the main cause of complaint was based on Section 8 (5) of the Act, the failure of the employer in good faith to bargain collectively with the representatives chosen by employes to deal with the management. The Board has received up to March 1 a total of 107 petitions asking either certification of representatives or the holding of elections under Board supervision to determine the bargaining agencies of the employes. A total of 53,886 employes joined in these petitions.

● ACCIDENTS in bituminous mines during February were responsible for the loss of 79 lives in the mining of 41,290,000 tons of coal, the per-million-ton fatality rate of 1.91 being the best established by the bituminous industry since April, 1933, when the rate was 1.86. Fatalities during the first two months of the present year have numbered 170 with a rate of 2.109 per million tons, as compared with the January-February, 1935, total of 159 and a rate of 2.223. Final reports covering operations during the calendar year 1934

show 958 fatalities and 46,982 injuries at bituminous mines, with per-million-man-hour rates of 1.62 and 79.49, respectively, as compared with 1933 rates of 1.48 and 77.86, respectively.

● THE MAKING of a V-type automobile engine is pictured interestingly in a new two-reel "silent" educational motion picture film prepared under the supervision of the United States Bureau of Mines, in cooperation with an automobile manufacturing establishment.

The story opens with the arrival and unloading of an ore boat and the storage of the iron ore. These scenes are followed by others that show the charging and tapping of the blast furnaces, the handling of molten iron, charging electric furnaces, adding alloys, building moulds, and casting molten metal. Heat treatment and machining operations in making various parts of the engine are pictured, as well as checking the finished parts for accuracy. Finally, the engine is put together on the assembly lines, tested, and placed in the chassis of an automobile.

Copies of this film in 16-mm or 35-mm sizes are loaned for exhibition purposes, to schools, churches, clubs, civic and business organizations, and others, upon application to the Bureau of Mines Experiment Station, Pittsburgh, Pa. No charge is made for the use of the films, but the exhibitor is asked to pay transportation charges.

● STOLEN ANTHRACITE is being trucked into Maryland from Pennsylvania at the rate of 396,700 tons a year, an increase of 112 percent in 12 months, according to a statement by the Anthracite Institute. Of this amount 231,100 tons are going to the Baltimore market area, where almost 40 percent of all sales of Anthracite of pea and larger sizes is trucked stolen coal.

Some legitimately mined coal is being carried from the Eastern Pennsylvania coal regions to Maryland by truck but this amounts to only 38,400 tons annually, or less than 9 percent of the total trucked volume, and this proportion is steadily decreasing as the stolen fuel invades the southern markets.

The city of Washington, D. C., though 175 miles distant from the hard coal region, is receiving Anthracite by truck at the rate of 17,900 tons annually, of which 14,800 tons, or 82.7 percent is stolen. In 1934 only 4,100 tons of stolen coal found its way to the national capital. Communities in Maryland suburban to Washington are using even more stolen coal than the capital city, the annual consumption of stolen coal for the entire metropolitan district being estimated at 32,800 tons.

Delaware's portion of stolen coal reaches 89,000 tons annually, of which 59,200 tons are consumed in the metropolitan area of Wilmington. Even Virginia is being reached by the stolen coal trucker, the annual rate of consumption being estimated at 1,900 tons.

● AMERICAN industry today is staging a comeback which should go far unless blocked by unsound legislation based on the "theories of academic non-producers," T. M. Girdler, chairman and president of Republic Steel Corp., said in an address before the American Zinc Institute, at St. Louis.

The real victims of unfair attacks upon business which threaten to cripple the efficiency of industry are millions of workers and investors as well as the consuming public, Girdler declared.

"The fundamental fallacy in these attacks," he said, "lies in the effort to make a distinction between industry on the one hand and the public on the other. A corporation does not live in a vacuum. It is an aggregation of human beings, of employes, investors and of management.

"Managers of industry have an obligation to defend the property of stockholders and the jobs of employes against measures which would undermine industry and crush enterprise.

"I wonder if those who give ear to the defamers of industry ever stop to think what industry means to this country and what it has contributed to the kind of a standard of living which exists here and nowhere else in the world.

"This is a vast country. To serve its needs and keep in step with the requirements of its growing population it was necessary that business should grow also, striving always for increased efficiency, improved products and lower prices.

"Big depressions always give rise to fantastic economic ideas and theories. We have had a great outcropping of quacks. They all advocate some sort of rearrangement of our economic system.

"The bureaucratic theorists who now presume to supervise American business have never produced the things and goods demanded by American consumers. They cannot, they never have, produced anything. All they do is to tell us how to stop producing. All they do is to tell us to do less than we are doing already."

Commenting on the outlook for the steel industry, Girdler said:

"Together with all other industries today, we are faced with the problem of how far government restrictions upon enterprise and the burden of taxation are to go.

"The plan to tax corporation surpluses is a case in point. This idea seems to have caused great excitement among politicians. They want to tax corporation reserves out of existence. Some inkling of the real character of this proposal is to be seen in the fact that it has received the endorsement of the Communist party in America.

"What would have happened in this country if corporations had possessed no reserves at the start of the depression? I can speak with intimate knowledge only of the steel industry. The existence of reserves enabled the steel industry to carry on through the depression, to maintain its plants, to spend large sums in relief and to sustain a loss over a four-year period of more than $285,000,000.

"The outlook for the steel industry is particularly bright if the natural forces of recovery now under way are permitted to operate.

"I see a million uses for metals and I see before us a great prosperity. But we and our investors and our workers cannot be prosperous when our chance to do a productive job well and honestly is constantly being hampered by misconceived and unfortunately motivated legislation. If they would only give us a chance, there is much we could do to bring real recovery to the United States."

● LATEST developments on price discrimination legislation (anti-chain store) indicated that the House bill had run into some delay, due to the tax bill. As yet the rule necessary for floor consideration in the House on the Patman bill (H. R. 8442) has not been granted. A group of Congressmen met as a steering committee this week and laid plans to secure House action on the measure after the tax bill and before the naval appropriation bill comes up for floor debate. This latter is one of the last of the usual annual appropriation bills yet to be considered. Sponsors of the bill expressed confidence it would be passed this session. Meanwhile in the Senate the Robinson bill (S. 3154) remained on the calendar. While Senator Robinson did not express any opinion, there were reports that the bill would be called up for action some time next week, while the Senate Finance Committee considered the tax bill.

● BASING POINT BILL: Hearings on the Wheeler anti-basing point bill (S. 4055) are expected to be resumed early next week. Plans were this week to conclude hearings on the Wheeler-Crosser rail labor bill, now pending before the Committee, and then resume on the basing point bill for the necessary additional time to conclude testimony. Still scheduled to be heard are representatives of the cement, lumber, food processing, and other industries.

— *Personals* —

R. L. Cox has been elected vice president of the Jeffrey Manufacturing Company.

T. R. Johns, general manager of Industrial Collieries Corp., Johnstown, Pa., coal mining subsidiary of Bethlehem Steel Company, has announced the appointment of **George Roberts**, general inspector, to the position of division superintendent of the Johnstown Division, succeeding the late **Frank Horton**, who died April 4. **Eugene I. Croyle**, Johnstown Division inspector, succeeds Mr. Roberts as general inspector and **Robert H. Ross**, safety engineer of the Johnstown Division, succeeds Mr. Croyle, while **George Wetzel**, assistant mine fore-

man, succeeds Mr. Ross as safety engineer of the Johnstown Division. These changes became effective on April 16, 1936.

Dr. Walter M. Fuchs has been named research associate professor in fuel technology at the School of Mineral Industries of Pennsylvania State College.

W. J. Loring, managing director of the Arizona Comstock Corp., Virginia City, Nevada, was recently in New York on business.

F. W. C. Whyte has resigned as general manager of the coal departments of the Anaconda Copper Mining Co. Mr. Whyte is 72 years of age.

Frank A. Ayer, general manager, Roan Antelope Copper Mines, Ltd., of Northern Rhodesia, has been on a several months' visit to the United States.

Guy E. Diehl, general mining engineer, Oliver Iron Mining Company, at Duluth, Minn., has been elected a vice president of the company and will have charge of mining engineering and the movement of ore.

John F. Thompson has been elected executive vice president of the International Nickel Co., of Canada, Ltd. **Paul D. Merica** and **Donald MacAskill** have been named vice presidents.

The Hatfield Campbell Creek Coal Co., at its recent annual meeting, held the following elections: **J. T. Hatfield**, chairman of the board; **Irvin Davis**, president, **J. T. Hatfield, Jr.**, first vice president; **William W. Miller**, treasurer; **Ed. Bramlage**, secretary, and **August Helm**, assistant secretary-treasurer.

Carl Zapffe

Carl Zapffe, in charge of mining properties of the Northern Pacific Railway, presented an interesting paper on "Development of Iron Mining in the Lake Superior District" at a recent meeting of the Duluth, Minnesota, Engineers' Club.

James F. McCarthy

James F. McCarthy, of Wallace, Idaho, president, Hecla Mining Co., has been chosen to receive the DeSmet Medal for 1936, from Gonzaga University, Spokane, Wash. The medal is presented each year to a Catholic layman for distinguished service to Church and state in the Northwest.

Robert W. Thomas has been elected governor of the Arizona Chapter of the American Mining Congress for the year 1936.

Thomas Hewes, formerly assistant secretary of the Treasury and special assistant to the Secretary of State, **E. Barrett Prettyman**, formerly general counsel of the Bureau of Internal Revenue and later corporation counsel of the District of Columbia and general counsel to the Public Utilities Commission and **F. Floyd Awalt**, formerly first deputy comptroller of the currency and counsel to the comptroller, have formed a partnership for the practice of law under the firm name of **Hewes, Prettyman and Awalt**. The firm will have offices in Washington, D. C., and in Hartford, Conn. Until April 15, 1936 the office in Washington will be in the Munsey Building and thereafter at 822 Connecticut Avenue. The office in Hartford will be at 93 Elm Street. **Dr. Henry L. Shepherd**, formerly assistant to the director of research and statistics of the United States Treasury, is associated with the firm as consulting economist.

Fred Sargent, president of the Chicago-Northwestern Railroad, was a speaker at the Annual Mineral Industries Conference at Urbana April 24.

Alexander Bonnyman, chairman of the board, Blue Diamond Coal Company, is leaving for a trip to Europe.

John T. Sydnor, general manager, Red Parrot Coal Company, was host on April 10, to the groups attending a joint meeting of the Coal River Mining Institute, and the District Committees for Central West Virginia, of The American Mining Congress.

Ernest L. Bailey, formerly consulting mining engineer, and chief of the West Virginia Bureau of Mines, has announced his candidacy for the Democratic Governorship of West Virginia.

Howard I. Young, president, American Zinc Lead and Smelting Company, was in Washington on April 27.

The District Committee of Northern West Virginia, of the Operators Section, Coal Division, The American Mining Congress, held a meeting at Fairmont, W. Va., on April 18. **H. B. Husband**, manager of Fuel Mines, C. & O. Rwy, is chairman of this section of the committee. About 20 operators were present.

F. F. Jorgensen, Consolidation Coal Company, has been confined to his home with a severe attack of influenza.

J. D. Conover, secretary of The American Mining Congress, attended the meeting of the American Zinc Institute, St. Louis, Mo., where he discussed the legislative problems of the industry.

D. R. Swem, Northwest Improvement Company, chairman for the Western Section of the Cincinnati meeting, says that the combined distance travelled by the group of men coming from the Northwestern coal fields would carry at least one of them completely around the world.

A. G. Mackenzie, and **Mrs. Mackenzie** are spending several weeks in the east. Mr. Mackenzie is secretary of the Utah Chapter of The American Mining Congress.

W. W. Dartnell, The Valley Camp Coal Company, advises that he has had over 100 applications from miners to enter the National Amateur Contest which will be a feature of the annual May meeting for the coal industry, sponsored by The American Mining Congress.

C. M. Watt has been elected president of the Loyal Hanna Coal & Coke Company. The properties of this company are located in central Pennsylvania.

Russell Hunt has been elected vice president in charge of sales for the Sloss-Sheffield Steel & Iron Company.

Among the visitors to the American Mining Congress during April were **J. H. Oliver**, general counsel, Glen Alden Coal Co.; **Felix E. Wormser**, Lead Industries Assn., New York City; **W. L. Tinker**, Lake Superior Iron Ore Co., Cleveland, Ohio; **J. B. Putnam**, attorney, Andrews, Hadden & Putnam, Cleveland, Ohio; **W. M. Sheehan**, General Steel Castings Co.; **E. V. Gent**, secretary, American Zinc Institute, New York City; **S. H. Yorks**, Bethlehem Steel Corporation.

Metals and Alloys in Acid Mine Water

THE first use of high Chrome-Iron alloys in the coal fields came as the result of investigations sponsored by Carnegie Institute of Technology, U. S. Bureau of Mines and an Advisory Board of Coal-Mine Operators and Engineers. Bulletin No. 4, entitled, "Corrosion Tests on Metals and Alloys in Acid Mine Waters From Coal Mines," summarizing these tests, was published in 1922. A great number of different alloys and metals, mostly non-ferrous, were exposed for long periods to waters from three different mines. Edna No. 1, Montour No. 1 and Calumet. These three mine waters were selected as representing typical acid conditions. The waters from Montour and Edna being extremely acid and from the Calumet mine, more dilute.

Among the alloys tried out was one containing 29.5 percent chrome, 0.27 percent manganese, 0.36 per cent carbon, 0.53 percent silicon, the balance being iron. This particular alloy showed a resistance to all three waters used in the tests and various mines began using this alloy for pumps and parts and other applications involving contact with acid mine waters. Minor mechanical difficulties developed, particularly with castings. As first made, castings showed some tendency towards brittleness, with uneven machining properties. They were also somewhat porous, which made certain uses of the alloy dangerous.

These difficulties were eliminated as foundries making the castings developed a proper technique. Today the production of such castings is on an entirely satisfactory commercial basis. Correct temperature control of the metal when poured, improved methods of molding and other foundry operations will produce castings which more than meet the exacting requirements of the pump manufacturers and general mine conditions.

Since 1922 a great many successful installations of high chrome-iron castings have been made in both the anthracite and bituminous fields. In some cases pumps made entirely from chrome-iron castings have been installed, in others chrome-iron impellers, and wearing parts have been used with bronze casings. It is interesting to note that no instance has been reported of electrolytic action between chrome-iron and bronze in acid mine waters.

Sufficient time has elapsed since the first installations of chrome-iron castings in coal mines to furnish valuable information as to the life of this alloy. Many mines report chrome-iron castings which have been in service from 7 to 10 years, with no appreciable evidence of corrosion.

Such results are secured when resistance to corrosion is the important requirement. Many applications are complicated by the presence of sand, coal dust and other abrasive agents in the water. Here again, chrome-iron, being resistant to abrasion, gives good results. Increasing the carbon in such castings increases the abrasion resistance, although at the same time lowering corrosion resistance. The experienced manufacturer will regulate the carbon contents of chrome-iron castings to insure the most suitable material for special applications.

In addition to pumps and pump parts, pipe and fittings, valves and similar parts, several collieries have used chrome-iron castings for jig grates with excellent results. The combined resistance to abrasion and corrosion of this alloy retards premature wear at the holes, thus maintaining the original diameter and preventing the loss of oversized coal. One colliery reports that chrome-iron jig grates cost about twice as much as ordinary grates and give on an average four times the life.

In spite of what has been said above as to improvements in characteristics of chrome-iron castings making parts such as impellers and casings from this alloy, comes a considerable hazard in the foundry. Closed impellers with thin vanes are difficult to cast in any metal. Minor changes in design such as eliminating too rapid a change in wall thicknesses, have been a help, but unavoidable foundry losses in making impellers have necessarily been reflected in selling prices. To help this situation, experiments were made with alloys in which the original 27-30 percent chrome, no nickel, composition was modified to some extent.

What was desired was an alloy which would be less viscuous and consequently more easily poured, particularly into thin sections and also with more strength. Both these requirements were met by decreasing the chrome contents and/or adding nickel.

Alloys containing lesser percentages of chrome, including 12-14 percent chrome and 16-18 percent chrome, were tried out but very evidently were not sufficiently high in corrosion resistance. One of the remarkable qualities of the 27-30 percent chrome-iron castings is that they seem to be almost completely resistant to mine water, no matter how dilute or concentrated the acid contents. Rolled bars or sheets of a 16-18 percent chrome alloy have given satisfactory service in coal mines but the life of castings of the same analysis has been too uneven to make it a suitable all-round material for such conditions.

Alloys with various percentages of nickel such as 4-6, 6-8 and 8-10 added to the original 27-30 percent chrome-iron composition were also tried and later the growing popularity of the 18 percent chrome, 8 percent nickel composition suggested its availability for this particular service.

The temptation for the foundry to add a certain amount of nickel to the original alloy was and is great. Such additions eliminate many foundry difficulties, insuring a much greater yield of good castings and this is particularly true of the foundry which has not had sufficient experience with high chrome-iron castings to develop the technique required to handle this somewhat temperamental alloy. Even the foundries which have learned from years of experience how to make 27-30 percent chrome-iron castings can offer 20-30 percent chrome, 8-12 percent nickel castings, particularly in such forms as closed impellers, at lower prices.

When such a foundry persists in recommending the use of straight chrome-iron castings for mine water service, some weight can be given to the opinion. In one mine 10 or 12 impellers were put in service, some from a 27-30 percent chrome, no nickel alloy and others from an alloy containing 24 percent chrome, 12 percent nickel. After three or four years of service it was found that every one of the straight chrome-iron impellers was in excellent condition and was put back in service. Such results are not peculiar but have been repeatedly observed.

Recently it has been found that small additions of nitrogen have a remarkable effect towards increasing the strength of chrome-iron castings and refining the grain. It is too soon to decide whether such use of nitrogen would lower corrosion resistance, in fact, tests lasting as long as three or four years will be required before a conscientious manufacturer can recommend high chrome-iron castings containing nitrogen for mine water service.

● A NEW CATALOG, No. 1520, 40 pages, 6 in. by 9 in. page size, beautifully illustrated, has been published by Link-Belt Company, Chicago, Philadelphia, San Francisco, on Link-Belt antifriction bearing units available in streamlined pillow block, hanger, takeup, flanged, duplex and special mountings. They also have released a new book, No. 1725, 32 pages, 8½ in. by 11 in. page size, with 30 illustrations, on Silverstreak silent chain drives obtainable from stocks carried at the company's warehouses and by authorized distributors located in important business centers. This stock group includes drives of ½ to 60 horsepower.

Complete details are tabulated for the wheels and chain constituting each drive; also list prices and horsepower and ratio tables. A few simple instructions for selecting a drive from the tables, are included, as are notes on design, and on the installation of steel casings. Page 31 gives the address of 64 distribution points.

Copies of these books will be sent upon request.

The Manufacturers Viewpoint

● INGERSOLL-RAND has recently announced a stopehamer that is faster and more powerful than any stopehamer previously built by them. The new tool makes use of an entirely different method of rotating the drill steel. The customary pawls, pawl-springs, and ratchets are no longer used. A reciprocating motion is imparted to the rifle bar by the movement of the piston, assisted by air pressure applied alternately to the faces of the rifle bar head. When the piston moves forward, the teeth of the rifle bar are actually lifted out of engagement, and the bar is rotated freely. When the piston reverses the teeth are forced back into engagement in an advanced position. The returning piston is rotated by the helical flutes of the locked rifle bar, causing the steel to rotate. The rifle bar teeth can be held out of engagement by air pressure controlled by the throttle valve. Thus hammer action without rotation is available for collaring a hole. This pneumatic "on-off" control without extra levers or buttons is made possible by the new rotation principle. The new stopehamer is made in two sizes designated "SAR 120" and "SAR 85." Both are unusually light in weight and low in air consumption. They are described in new bulletin No. 2245, copies of which may be had from Ingersoll-Rand Co., 11 Broadway, or any branch office.

● AVAILABLE on request through The Linde Air Products Company, 30 East 42nd Street, New York City is a 12-page, excellently illustrated booklet on the oxy-acetylene welding of brass and bronze.

● AFTER April 11, 1936, the New York offices of Hercules Powder Company will be at 22 East 40th Street at Madison Avenue.

● ALLIS-CHALMERS announces a new line of two-stage sliding vane rotary air compressors for pressures up to 100 lb. G. The design is entirely unique in that both stages as well as the inter-cooler, are contained in a single casing. This new type of compressor is designated the "Ro-Twin." Compared with the usual design of two-stage rotary having two separate cylinders, it offers the advantages of greatly reduced length and floor space, still less weight, only one stuffing box and one coupling, no external air piping between stages to keep tight and a simpler lubrication system. Having only two bearings, and one flexible coupling, alignment is easily maintained. The air delivery is free from pulsations and the operation smooth, quiet and vibrationless. The design is made possible through the employment of the wear-eliminating "floating rings" which have been a feature of Allis-Chalmers sliding vane rotary compressors and vacuum pumps. A complete line of "Ro-Twins" has been developed, from 20 HP, 1740 RPM to 100 HP, 690 RPM, for actual air deliveries from 69 cfm to 412 cfm at 100 lb. G air pressure. This company also has recently developed an additional line of screens designated as their "Low-Head Vibrating Screens." This new line was designed for existing installations where head room is at a premium, and is also available for new plants that wish to conserve head room or elevation.

The new Low-Head Horizontal Screens are suspended by cables and springs, similar to Aero-Vibe Screens, but the mechanism has been newly developed especially to impart to the body of the screen a straight line motion at a definite angle relative to the horizontal. The deck of the screen is perfectly horizontal and the forward and upward motion imparted to the screen by the mechanism advances the material along the surface of the screen and segregates the finer particles on the bottom so that the undersize is quickly removed when coming in contact with the screen surface.

The vibration of the screen is positive in that a definite predetermined throw or amplitude of vibration is produced. The mechanism of this Low-Head Screen is totally enclosed and mounted in high-grade anti-friction bearings of liberal size. No daily lubrication is necessary as the entire mechanism runs in oil, requiring only periodic check for oil level and change of oil in the spring and fall.

● ROCK DRILLS do not usually give satisfactory performance when drilling soft material. Sullivan Machinery Co. has designed the H-2. By means of a simple change it can be made into a machine which will give good performance in hard rock. The H-2 was purposely designed for auger drilling, and is therefore especially adapted for use in drilling soft iron ore, anthracite, gypsum, limestone, slate, shale, frozen ground, or any heavy, sticky formation, because of its tremendous stalling torque resulting in an extra strong rotation. Stalling, consequently, is greatly minimized, and the result is a superior auger drill. Some of the features are: Superior drilling speed in auger conditions, ease of operation, surprisingly low upkeep cost.

● A NUMBER of earlier types of traction motors for mine haulage were equipped with brushholders having one insulated mounting pin. With constantly increasing loads, motors became overheated with a consequent loosening of the mounting pin. Through a redesign of these brushholders employing two insulated mounting pins instead of one, Westinghouse engineers have overcome the trouble due to heating. The new brushholder with new blocks required for mounting in motor frame is shown for the type 902 motors. They are also available for types 904 and 909 motors. In addition to the new method of mounting the latest type of Twin Washer Finger construction is incorporated. The new mounting blocks were designed to simplify mounting of brushholders and to properly locate brushes in the correct neutral position.

For further information address Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa.

● THOMAS I. PARKINSON and GEORGE A. RANNEY have been elected new directors of the Westinghouse Elec. & Mfg. Company. Mr. Parkinson, president of the Equitable Life Assurance Society of the United States, is also a director of the Consolidation Coal Company, Inc. Mr. Ranney, chairman and director of the People's Gas Light and Coke Company of Chicago, is also a director and member of the executive committee of the International Harvester Company.

Mining Industry Helps in Emergency

ON March 17, as a result of heavy rainfalls in the areas drained by the Allegheny and Monongahela Rivers forming the Ohio in Pittsburgh, these streams reached a high water mark never before reached in the history of the Weather Bureau and dating back to 1765. The flood stage at the junction of the two rivers in the heart of the City of Pittsburgh is 25 feet. The previous high mark of record, reached in the disastrous flood of 1907, was 38 ft. The height reached on the afternoon of March 17, 1936 was 46.2 ft., which gives some idea of the flooded condition. The greater part of the Golden Triangle of downtown Pittsburgh, the Southside, the lower part of the whole Northside area, and most of the towns along the Allegheny and Monongahela Rivers for considerable distances were under water.

About noon on March 17 the three large steam power plants serving the Pittsburgh area were flooded with water and went out of commission. Two of these plants, operated by the Duquesne Light Company and the West Penn Power Company, are located on the Allegheny River 12 miles above Pittsburgh; and the third plant, owned by the Duquesne Light Company is located on an island in the Ohio River five miles below the junction where the two rivers form the Ohio.

By Thursday afternoon, March 18, the waters had receded so that most of the downtown streets in Pittsburgh were free of water, but practically all of the sewers and the basements were filled with water, and many of the power, gas and telephone lines in the downtown area were affected. With no power available to operate electric pumps and no electric lights available for men working in the basements, the problem of restoration was a most difficult one.

The coal mining companies were first called upon to furnish electric cap lamps and gasoline-generating engines, many of which were available in the western Pennsylvania and northern West Virginia area, for stand-by fan equipment. One 300 K-W set was moved in from a northern West Virginia mine, a distance of 120 miles, and was utilized to great advantage in pumping out the basements of the Koppers Building. The coal companies were also, in the very early stages of the recovery work, called upon to furnish large quantities of pipe and hose for the pumping operations; and the Mine Safety Appliances Company and the Bureau of Mines were called upon by various hospitals, post offices, banks, and public utilities to supply miners electric cap lamps for illumination and flame safety lamps for gas testing. At one of the hospitals the miners electric lamps were an indispensible aid in bringing into the world twin babies.

As the water receded and makeshift pumping devices of all kinds brought about the de-watering of the basements, it became evident that there was a serious gas problem in the flooded area due to breaks in the gas lines, backing up of sewers, and because the rapid rising of the water forced people out of their homes without having time to turn off the gas and when the water receded the gas trapped in the pipes flowed into the buildings.

The Public Safety Department of the city became alarmed after a few minor explosions, and they called the Federal Bureau of Mines and the Pennsylvania Department of Mines into a conference at which it was decided that all open lights and flames should be excluded from all basements in the flooded area until the buildings had been examined for gas, and that no power or gas should be turned on until the sections had been passed on as free from gas.

The problem of finding competent men and necessary equipment to do this work quickly was solved by a radio broadcast calling for volunteer certified mine officials to report to the Bureau of Mines on Friday morning equipped with the flame safety lamp and an electric cap lamp. About 200 volunteers responded fully equipped. They were mobilized in squads of five men, each in charge of a leader and an assistant to keep notes. The leaders were usually the State Mine Inspectors, the Bureau of Mines engineers, mining engineers, and mine officials. The city was districted and the work of examining for hazardous gas conditions was quickly organized and underway.

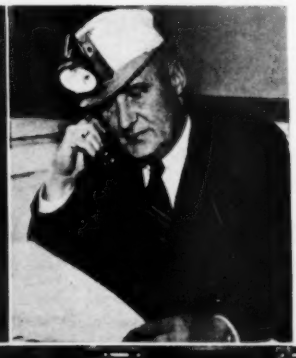
The city authorities worked very closely with this group, and whenever a block was certified as being free of gas it was reported to the Bureau of Building Inspection of the city who, in turn, notified the public utilities and the building owner that they could have power and gas.

The Mine Safety Appliances Company was called upon to set up a charging station at the Bureau of Mines to charge and service the electric cap lamps and also to service the flame safety lamps.

The question of finding leaks in gas mains, caused largely by the washing away of the ground under the mains, was a very difficult problem, and the Mine Safety Appliances Company was called upon to supply sensitive combustible indicators to the utility companies and the city, and these instruments greatly facilitated the location of leaks.

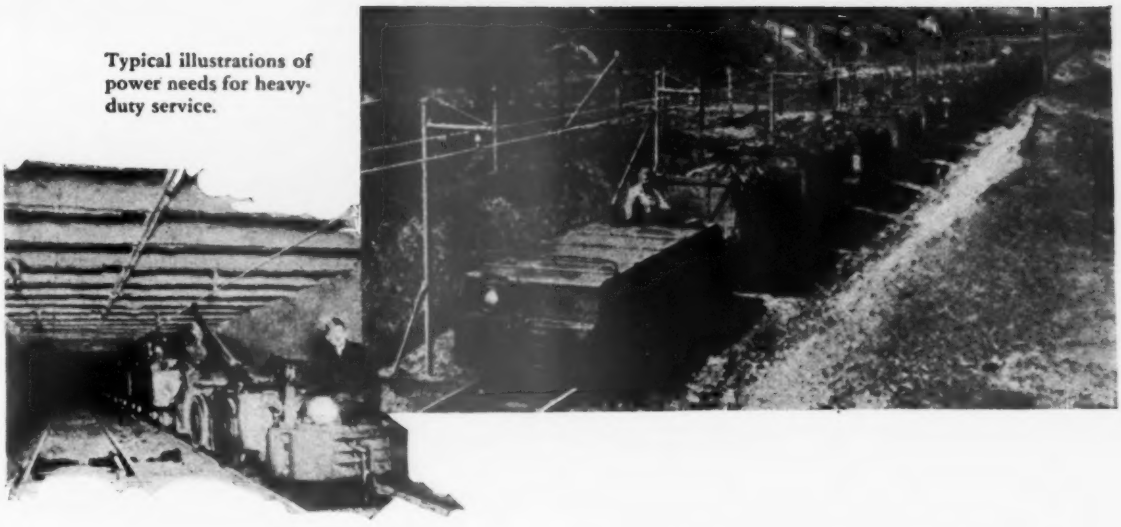
Upper Left.—Testing for Gas After Flood Waters Had Receded

Right:—Colonel Andrew B. Berger, President, Potter Title and Trust Co., Conducting Business Through Aid of Edison's Electric Cap Lamp



Lower Left. — Employes of Pittsburgh Bank Utilizing Elec- Cap Lamps

Right. — Pennsylvania Bituminous Slate Mine Inspectors and Bureau of Mines Engineers Who Supervised Inspection of All Buildings for Gas



Typical illustrations of power needs for heavy-duty service.

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